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# Water Chemistry of Some Lakes and Channels in the Mackenzie Delta and on the Tuktoyaktuk Peninsula, N.W.T., 1985

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## Canadian Data Report of Fisheries and Aquatic Sciences

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# Abstract

ANEMA, C., R.E. HECKY, E.J. FEE, D. NERNBERG, AND S.J. GUILDFORD. 1990. Water chemistry of some lakes and channels in the Mackenzie Delta and on the Tuktoyaktuk Peninsula, N.W.T., 1985. *Can. Data Rep. Fish. Aquat. Sci.* 726: vii + 73 p.

Biweekly water chemistry data for five lakes and Kukjuktuk Bay on the Tuktoyaktuk Peninsula and four lakes and two channels in the Mackenzie Delta are presented for the open water season of 1985. Several locations that were sampled only once are alsc included. Time variations of a set of chemical and water quality variables are discussed in detail. Comparisons of specific conductance measured *in situ* and in the FWI laboratory reveal that the *in situ* values in the Kukjuktuk lakes are lower than the FWI values while in the Delta lakes the reverse is found. Comparisons of the pH measured *in situ* and in the FWI laboratory reveal that the difference, FWI pH – *in situ* pH, decreases with time for both the Kukjuktuk and Delta lakes. Discrepancies are found between chlorophyll measured in the FWI laboratory and the Inuvik laboratory and between the total inorganic carbon measured in the Inuvik laboratory and the total alkalinity of the Delta lakes samples as measured in the FWI laboratory. The Kukjuktuk lakes and the Delta lakes may be differentiated on the basis of their total inorganic carbon concentration relative to the dissolved inorganic carbon concentration in water in equilibrium with the atmosphere. The Delta channels have a significant component of suspended inorganic carbon.

**Key words:** water quality; water chemistry; Mackenzie Delta; Tuktoyaktuk Peninsula; lakes; channels.

# Résumé

ANEMA, C., R.E. HECKY, E.J. FEE, D. NERNBERG, AND S.J. GUILDFORD. 1990. Water chemistry of some lakes and channels in the Mackenzie Delta and on the Tuktoyaktuk Peninsula, N.W.T., 1985. *Can. Data Rep. Fish. Aquat. Sci.* 726: vii + 73 p.

On présente des données, obtenues à tous les quinze jours, sur la chimie de l'eau de cinq lacs et de la baie Kukjuktuk, sur la péninsule de Tuktoyaktuk, et de quatre lacs et de deux chenaux dans le delta du Mackenzie en 1985 pendant la saison où la surface de l'eau n'était pas envahie par les glaces. On présente également des données obtenues à plusieurs endroits qui n'ont été échantillonnés qu'une seule fois. On examine en détail la variation avec le temps d'un ensemble de paramètres relatifs à la chimie et à la qualité de l'eau. Lorsqu'on compare la conductivité mesurée *in situ* et au laboratoire de l'Institut des eaux douces, on constate que les valeurs mesurées *in situ* dans les lacs aux environs de la baie Kukjuktuk sont plus faibles que celles mesurées au laboratoire, tandis que c'est l'inverse que l'on observe dans les lacs du delta. Lorsqu'on compare le pH mesuré *in situ* et au laboratoire de l'Institut, on constate que, dans le cas des lacs aux environs de la baie Kukjuktuk et des lacs du delta, la différence entre le pH mesuré au laboratoire et le pH mesuré *in situ* diminue avec le temps. Il y a des écarts entre les quantités de chlorophylle mesurées au laboratoire de l'Institut des eaux douces et au laboratoire d'Inuvik et entre la teneur en carbone inrganique total mesuré au laboratoire d'Inuvik et l'alcalinité totale des échantillons d'eau des lacs du delta mesurée dans le laboratoire de l'Institut. On peut distinguer l'eau des lacs aux environs de la baie Kukjuktuk de l'eau des lacs du delta à partir de leur teneur en carbone inorganique total par rapport à leur teneur carbone inorganique dissous en équilibre avec l'atmosphère. Des chenaux du delta présentent une teneur élevée en carbone inorganique en suspension.

**Mots-clés:** qualité de l'eau; chimie de l'eau; delta du Mackenzie; péninsule de Tuktoyaktuk; lacs; chenaux.

## Introduction

Four species of whitefishes, broad whitefish, *Coregonus nasus* (Pallas), lake whitefish, *Coregonus clupeaformis* (Mitchill), arctic cisco, *Coregonus autumnalis* (Pallas) and least cisco, *Coregonus sardinella* (Valenciennes) make up a major portion of fish catches in the nearshore southern Beaufort Sea and Mackenzie Delta (Lawrence et al. 1984). All four species migrate upstream into the Mackenzie River to spawn. The smaller lakes of the Tuktoyaktuk peninsula and the Mackenzie Delta are utilized for feeding and rearing. The relatively warm, dilute Mackenzie River water which floods the inshore, shallow waters of the Southern Beaufort Sea serves as a corridor between these two locations. The biology of these species has been discussed by Bond and Erickson (1985), Lawrence et al. (1984) and has recently been reviewed by Strange (1985). It is clear that the freshwater and nearshore coastal habitats are critical to these species and that stocks dependent on these habitats could be vulnerable to the oil and gas developments which undoubtedly will occur in this region in the future.

This study was undertaken to examine the limnology of lakes utilized by coregonids of the Mackenzie Delta and southern Beaufort Sea. A variety of studies, the results of which are published elsewhere, were undertaken simultaneously. The purpose of this report is first to present the chemical and water quality data obtained in the summer of 1985 and second to examine the data in a preliminary manner.

## Study area

Figures 1 to 4 show the location of the study areas. The Delta lakes are readily accessible by boat from Inuvik from where the Tuktoyaktuk lakes are readily accessible by air charter. Hydrologic and bathymetric data are available for the Delta lakes (Bigras 1987; Fee et al. 1988) and the Tuktoyaktuk lakes (Fallis, Department of Fisheries and Oceans, Winnipeg, Manitoba, unpublished data) chosen for this study.

The Mackenzie Delta is dominated by lakes and channels which are constantly changing due to active erosion; over 50% of the Delta surface is water (Marsh 1986). The Delta lakes have poorly defined watersheds because the topography is very flat. The hydrologic regime of these lakes is dominated by the invasion of spring runoff water from the Mackenzie River. After the spring flood recedes the water level in the lakes is regulated by the height of the levees separating the lakes from the river channels. These levees also affect the use fishes make of these lakes. Bigras (1985) and Marsh (1985) have described the hydrology of some Mackenzie Delta lakes, including some studied here.

Big Lake Channel, (unofficial name used by people at the National Hydrology Research Institute (NHRI)) a main distributary off East Channel in the Mackenzie Delta, flows through the centre of Big Lake whose inflow and outflow are on opposite sides of the lake, while Skidoo Lake, on a small distributary, has its inflow and outflow very close together. South Lake and South Lake Bay are a pair of lakes connected to Big Lake Channel (Fig. 3) by a reversing flow channel.

The hydrology of the lakes in the Kukjuktuk drainage is dominated by the snowmelt runoff in the spring. Lakes 28, 14 and 18 are part of a chain of lakes as are lakes 33, 7 and 10 on parallel branches of Kukjuktuk Creek. Lakes 28 and 33 are headwater lakes (Fig. 2).

## Methods

### Field work

Lakes and channels in the Delta were sampled by boat while the lakes in the Tuktoyaktuk peninsula were sampled by fixed wing aircraft. Two integrated water samples were taken at each station by the method of Fee (1976) using a 4 liter polycarbonate bottle wrapped with black tape and a 2 liter amber polypropylene bottle. A Hydrolab digital model 4041 meter and sonde was used to obtain *in situ* pH, temperature and specific conductance. The *in situ* dissolved oxygen was also obtained but has not been reported here.

The sonde unit was equipped with a Beckman Lazaran pH reference electrode which has been found to perform well in low specific conductance ($< 200\ \mu S \cdot cm^{-1}$) environments (Hydrolab Lazaran Bulletin, November 1984) and circulator assembly. The calibration of the Hydrolab unit was checked regularly before and after use. The physical limnological field data have been reported by Fee et al. (1988). Samples were returned to the laboratory for processing within four hours from either sampling area.

The Hydrolab instrument may have malfunctioned due to a low battery on August 29 (Delta Lakes). This condition affects the specific conductance measurements first, yielding results that are too low, then if the battery is sufficiently low the pH measurements are affected (Hydrolab Corp. pers. comm.).

## Laboratory processing

Processing was done at the Inuvik Scientific Resource Centre of the Department of Indian Affairs and Northern Development (DIAND). Water from the 4 liter sample was used for all analyses except the filtered suspended solids analyses (FSS) which were done using water from the 2 liter sample. All filtrations were done using ignited Whatman GF/C filters.

### 4 liter sample

Subsamples for analysis were taken in the following sequence; total inorganic carbon (TIC), primary production, nutrient status, filtered fractions, suspended nitrogen and carbon (SNC, fractions combined on one filter), suspended phosphorous (SP) and chlorophyll-a which was sampled in duplicate for comparative analysis by the analytical unit of the Freshwater Institute (FWI) and by the field laboratory in Inuvik. The routine volumes filtered were 250 mL for each of SP and chlorophyll-a and 500 mL for SNC subsamples. Exceptions occurred when large quantities of suspended material were present in the Delta samples at which times smaller volumes were filtered. The final subsample taken from the 4 liter field sample was to determine total alkalinity (TA) and soluble reactive silica (SRSi). The filtrates obtained from the SNC, SP and one chlorophyll-a filtrations above were used to prepare subsamples for the analysis of major anions ($Cl^-$ and $SO_4^{2-}$), major cations ($Na^+$, $K^+$, $Ca^{2+}$, $Mg^{2+}$) and total dissolved iron (TDFe), dissolved organic carbon (DOC), total dissolved nitrogen (TDN) and total dissolved phosphorous (TDP). Details of how these subsamples were prepared are given in Table 1. All analyses, except chlorophyll-a which was done as described below, were done by the analytical unit of the FWI using the methods of Stainton et al. (1977). TIC was analyzed at the Inuvik laboratory using a Carle 7500 portable gas chromatograph. Commercial (BDH) N/50 $Na_2CO_3$ was used, after suitable dilutions, as a standard. Chlorophyll-a was analyzed by extracting the filtered solids with 10 mL of 95% methanol (MeOH) for 12 hours at 4°C and reading the fluorescence of the extract on a Turner model 111 fluorometer as per Stainton et al. (1977). The fluorometer was calibrated with a chlorophyll-a solution prepared and standardized by the analytical unit of the FWI. This solution was shipped to the Inuvik laboratory where it was used to calibrate the fluorometer whereupon it was returned to the FWI where it was restandardized and found to be as when first shipped to the Inuvik laboratory.

### 2 liter sample

The 2 liter sample was used for suspended solids analysis. The filtered suspended solids subsample was obtained by filtering as large a volume as possible through a preweighed filter. The volume filtered was limited only by the volume available (Kukjuktuk lakes), approximately 1800 mL, or by the filtration time (Delta lakes). Approximately 100 mL of the filtrate was centrifuged at approximately 1750 g for at least 20 minutes using an International clinical bench top centrifuge. Absorbances of the unfiltered, filtered and fil-

tered/centrifuged water were measured at 543 nm in a 10 cm cuvette as a relative measure of the suspended solids. The absorbance of the filtered/centrifuged fraction was also measured at 455 nm as a relative measure of the humic content. All absorbances were measured relative to distilled water. Preweighed filters were prepared at the FWI. After use the filters were dried in a dessicator in Inuvik and then returned to the FWI for reweighing.

### Interlaboratory comparisons

Specific conductance and pH were measured *in situ* and on the samples sent to the FWI for analysis. Chlorophyll-a was analyzed by both the Inuvik and the FWI laboratories. The analyses and measurements done by the FWI are referred to as "FWI" analyses or measurements while measurements made in the field are referred to as "*in situ*" measurements and analyses done in Inuvik are referred to as "Inuvik" analyses.

Water used to measure specific conductance and pH at the FWI was equilibrated with atmospheric $CO_2$ prior to measurements being made at 25°C.

In calculations and when plotting data any < and > symbols were ignored.

## Results

Any results obtained in mass units have been converted to micromolar units. Only chlorophyll-a and FSS are reported in mass units, $\mu g \cdot L^{-1}$ and $mg \cdot L^{-1}$, respectively. Table 2 is a list of factors used to convert the chemical parameter from mass units to micromolar units.

Analytical results including blanks are reported in Tables 3 to 6 and have been expressed, where possible, in micromolar concentrations.

Tables 7 and 8 are the results of calculations done with the data in Tables 4 and 5 while Table 9 lists the physical constants used in the calculation of the results in these tables.

Tables 10 and 11 list maximum, minimum, mean, standard deviation and the statistical sample size for all data variables for each station and for each group of stations in Tables 4 and 5, respectively, while Tables 12 and 13 list the same statistics for the results calculated in Tables 7 and 8 in the same groupings.

Table 14 is a list of specific conductance data which have been judged to be outliers.

Table 15 is a comparison of Kukjuktuk Bay water to 35 per mill seawater.

NA in the tables means that no data is available.

### Blanks

Results of TSC (total suspended carbon), SN (suspended nitrogen), SP and TDP analyses have not been corrected for blanks. Table 3 reports this data separately. The SN, TSC and SP blanks are produced from unused GF/C filters and are reported in units of $\mu$mol per filter disc. When the filters are used the material causing the blank can remain with the filter or be washed from the filter and affect the filtrate. The phosphorous in the filters is not readily washed from the filters and remains with the filters under normal filtering conditions (Stainton, Department of Fisheries and Oceans, Winnipeg, pers. comm.). The fate of the material causing the SN and TSC blanks is not certain.

Most SN and SP blanks are below the detection limit. The means of all the SN, SP and TSC blanks in Table 3 includes those below the detection limit as being at the detection limit resulting in averages that are probably too high (an alternate method would be to set all blanks that are below the detection limit to 0 and average over the total number of blank observations). To use the SN, SP and TSC blanks to correct the suspended fractions they must be divided by the volume filtered (in litres) for each sample. For a routine SP sample 0.25 litre is filtered while for routine SNC samples 0.5 litre is filtered. Using these factors the mean SN blank, ¡0.10 $\mu mol \cdot disc^{-1}$ (Table 3), is less than 7% of the lowest SN sample (3.0

$\mu$mol·L$^{-1}$, Table 11). Similarly the mean SP blank, (¡0.032 $\mu$mol·disc$^{-1}$ (Table 3), is 90% of the lowest SP sample (0.142 $\mu$mol·L$^{-1}$, Table 10). However this mean is probably excessively high because only one of 16 SP blanks is above the detection limit. The mean TSC blank ¡1.78 $\mu$mol·disc$^{-1}$ (Table 3), is less than 14% of the lowest TSC sample (26.6 $\mu$mol·L$^{-1}$, Table 11) in a similar calculation.

If the correction is to be applied to the dissolved fraction the blanks should be multiplied by 3 discs·L$^{-1}$ (3 filters into 1000 mL of filtrate) for routine filtrations. Relative to the lowest DOC sample, 120 $\mu$mol·L$^{-1}$, (Table 10), the TSC blank, ¡1.78 $\mu$mol·disc$^{-1}$ (Table 3), would cause an error of less than 5%. If the TSC blank affects the dissolved inorganic carbon (DIC) fraction the dissolved alkalinity (DA) would also be affected, (< 2%), as would be some associated anion. TIC analyses in this study were done on unfiltered water.

The vials used for TDN and TDP subsamples were found to be heavily contaminated with nitrogen and somewhat by phosphorous and therefore the TDN results of these samples are not reported. Two sets of TDN and TDP blanks were prepared with the samples. The first set was analyzed along with the respective samples while the second set, labeled as "late blanks" in Table 3, was stored at least three months before analysis. Both TDN and TDP "late blanks" are significantly higher than the "early" blanks suggesting time varying blanks. The mean of the TDP "late blanks" is about twice that of the "early" blanks with a similar variance while the mean of the TDN "late blanks" is higher by a factor of about 25. The variance of TDN "late blanks" is over 1100 times that of the "early" blanks.

Blank analyses done on FSS filters were below the limit of detection.

# Discussion

## Time variation of water quality variables

### Filtered suspended solids (FSS)

FSS concentrations (Fig. 5) in Kukjuktuk Bay and in the Kukjuktuk lakes are uniformly low, 1–6 mg·L$^{-1}$. Kukjuktuk Lake 28 consistently has the lowest FSS while Kukjuktuk Bay and Lake 10 have the highest.

FSS concentrations in the Delta channels and Big Lake are very high (up to 314 mg·L$^{-1}$) early in the season and decrease continuously to a minimum on July 3. Up to June 28 the concentrations in the channels and Big Lake decrease at similar rates but between June 28 and July 3 the FSS in Big Lake decreases more rapidly in Big Lake than in the channels to concentrations just greater than that of Skidoo Lake. During the period June 18 to June 28 Skidoo Lake FSS increases to a maximum followed by a decrease to a minimum on July 3 coincident with the minimum in the channels and Big Lake. Although no FSS data is available for South Lake and South Lake Bay for June 23 to July 3 the changes in FSS may be tracked through the changes in the unfiltered absorbance at 543 nm. This variable shows a continuous decline over the period June 18 to July 15. By the middle of July the suspended load in all the Delta waters except South Lake and South Lake Bay has increased to a maximum after which the FSS levels in the channels drop smoothly until the end of August. Big Lake experiences an increase in FSS in the middle of August so that it again is similar to the channels as at the beginning of the season. Near the end of the summer the channels experience an increase in FSS. A similar change is observed in Big Lake and Skidoo Lake but not in South Lake and South Lake Bay.

### Chlorophyll-a

Concentrations of chlorophyll-a in Kukjuktuk Bay and Kukjuktuk Lake 28 range between 0.9 and 2 $\mu$g·L$^{-1}$ throughout the summer with

very little seasonal change while the concentration in Lake 18 is consistently in the range 2.6–3.9 $\mu g \cdot L^{-1}$. Lakes 7, 10 and 14 show some variation through the summer and of these only lake 10 shows a large maximum, 11.6 $\mu g \cdot L^{-1}$, early in the summer (Fig. 6).

Larger variations in chlorophyll-a concentrations are observed in the the Delta waters (Fig. 6). The concentrations in the two channels and Big Lake are very similar throughout the summer. In these waters the chlorophyll-a concentration is low early in the summer, except for a small maximum, 3.7 $\mu g \cdot L^{-1}$ on July 3. These three bodies of water attain maximum chlorophyll-a concentrations at the end of the summer, 6.5 $\mu g \cdot L^{-1}$ on August 29. South Lake and South Lake Bay have a chlorophyll-a maximum early in the season, 8.2 $\mu g \cdot L^{-1}$ on June 23. Except for a small maximum each, 4.5 $\mu g \cdot L^{-1}$ on August 13 in South Lake Bay and 5.8 $\mu g \cdot L^{-1}$ on July 3 in South Lake, chlorophyll-a concentrations in these two lakes decreases through the summer after the initial maximum on June 23. Chlorophyll-a concentration in Skidoo lake is the highest of all Delta waters sampled on June 18. With minor exceptions the chlorophyll-a concentration in Skidoo Lake decreases through the summer and exhibits neither an early nor late summer maximum as do the other lakes and channels.

### Suspended N, P and C

Temporal variations of these three nutrient fractions are almost identical in all the Kukjuktuk lakes. Lake 10 has the highest concentrations with a strong maximum on July 18, similar to chlorophyll-a, and significant SN but weaker SP and TSC maxima on August 27. Lake 28 has the lowest concentration and is quite invariant throughout the summer. Lake 7 has a late summer (August 27) maximum; strongest in SN, weakest in SP. Lakes 14 and 18 are relatively constant in all three fractions throughout the summer. Kukjuktuk Bay has lower TSC and SN concentrations than all the Kukjuktuk lakes studied. However SP is lower in Lake 28 than in Kukjuktuk Bay. These patterns of SN, TSC and SP concentrations are very similar to that of chlorophyll-a and the available FSS data, Kukjuktuk Bay excepted, (Fig. 7, 8 and 9).

In the Delta lakes and channels SN, SP and TSC (Fig. 7, 8 and 9) vary in the same way that FSS does (Fig. 5). The SN maximum on July 15 is particularly strong in the East Channel. Unlike the Kukjuktuk lakes, the concentration patterns of these nutrients do not bear a strong resemblance to the chlorophyll-a concentration patterns of the Delta lakes and channels.

### Total inorganic carbon (TIC)

Throughout the summer TIC in each of the Kukjuktuk lakes is maintained within very narrow limits that are characteristic of each lake (Fig. 10). Only lakes 7 and 14 have overlapping ranges, the former having TIC concentrations in the upper range of the latter. They are ordered by concentration 28 > 18 > 7 > 14 > 10.

Kukjuktuk Bay TIC increases from 1194 $\mu mol \cdot L^{-1}$ on July 18 to a maximum, 1796 $\mu mol \cdot L^{-1}$, on August 15 and remains slightly below that for the rest of the summer.

The Delta lakes and channels have more variable TIC concentrations than the Kukjuktuk lakes (Fig. 10). TIC in the East Channel decreases from an initial high on June 15 to a minimum on June 28 after which date there are maxima on July 3 and August 13. TIC in Big Lake Channel is similar except for an increase in concentration from the June 18 to June 23. Concentrations in Big Lake Channel are lower throughout the summer except on July 29 and August 13 when TIC in NRC Channel is slightly higher than in the East Channel. Big Lake shows changes similar to changes in Big Lake Channel but at lower concentrations. Before July 15 TIC concentrations in Big Lake are not as high as those in East Channel and Big Lake Channel but they are similar after that date. South Lake, South Lake Bay and Skidoo Lake initially have the same concentration pattern, an increase in concentration from June 18 to 23 followed by a decrease on June 28

which is larger in Skidoo Lake. After that date Skidoo Lake TIC is similar to that in the channels. South Lake and South Lake Bay show a very sharp maximum on July 3 followed by a minimum and another maximum on August 13 which is stronger for South Lake than for South Lake Bay. After this date both lakes decrease rapidly in TIC to August 29. On August 13 South Lake has the highest TIC observed in this study in 1985 (2252 $\mu$mol·L$^{-1}$) while on August 29 South Lake Bay attains the lowest TIC concentration observed in 1985 (1937 $\mu$mol·L$^{-1}$) in the Delta stations. After August 29 South Lake TIC remains above while South Lake Bay TIC remains below the TIC levels observed in the other lakes and channels.

The TIC of the Kukjuktuk and Delta waters are distinct with only slightly overlapping ranges. The maximum TIC in the Kukjuktuk lakes is 85 $\mu$mol·L$^{-1}$ higher than the minimum concentration observed in the Delta.

### Dissolved organic carbon (DOC)

DOC concentrations (Fig. 11) in Skidoo Lake, South Lake and South Lake Bay on June 18 are nearly identical, 760 $\mu$mol·L$^{-1}$, while the two channels and Big Lake are nearly identical at a lower concentration, 550 $\mu$mol·L$^{-1}$. Concentrations in the channels and Big Lake decrease gradually throughout the summer from 560 $\mu$mol·L$^{-1}$ to 390 $\mu$mol·L$^{-1}$ with a small minimum and maximum in late June and early July. DOC in Skidoo Lake decreases from the initial maximum concentration until by July 3 it is similar to the concentration in Big Lake after which date changes in concentration are similar to those in Big Lake and the channels although always at a slightly higher concentration. South Lake and South Lake Bay remain high in DOC until the middle of August when they both decrease rapidly until the end of August. South Lake DOC continues to decrease in September.

Changes in DOC concentration (Fig. 11) are similar in all the Kukjuktuk lakes at concentrations similar to those observed in the Delta channels (340–560 $\mu$mol·L$^{-1}$). Concentrations in lakes 14 and 18 are consistently lower than in lakes 7, 10 and 28. The overall pattern is a broad summer maximum.

Kukjuktuk Bay has the lowest concentrations of DOC of all the waters studied. There is an initial minimum (120 $\mu$mol·L$^{-1}$) and the concentration rises to a midsummer maximum (320 $\mu$mol·L$^{-1}$) after which the concentration remains relatively constant for the remainder of the summer.

### Total dissolved phosphorous (TDP)

TDP concentrations (Fig. 12) in the Delta waters display a very consistent pattern. An early summer maximum (0.484–0.613 $\mu$mol·L$^{-1}$) and, with some minor fluctuations, decreasing concentrations throughout the summer. Early in the summer concentrations in Skidoo Lake, South Lake and South Lake Bay are higher than in the channels and Big Lake. The greatest range of concentrations observed among the Delta waters on any one day is early in the summer, June 18, (0.340 $\mu$mol·L$^{-1}$) while the smallest daily range (0.033 $\mu$mol·L$^{-1}$) is observed at the end of the summer, September 10.

The Kukjuktuk Lakes, particularly lakes 7, 18 and 28, are initially somewhat lower in TDP concentrations (Fig. 12) than the Delta waters but are similar after that. The concentration of TDP in Kukjuktuk Bay increases through the summer, from 0.387 to 0.581 $\mu$mol·L$^{-1}$.

### Soluble reactive silica (SRSi)

SRSi concentrations (Fig. 13) in the Kukjuktuk lakes are low throughout the summer, ¡6 $\mu$mol·L$^{-1}$. Small decreases in concentration were observed in lakes 7, 14, 18 and 28 early in the open water season to about 1–2 $\mu$mol·L$^{-1}$ which concentrations are maintained by all the Kukjuktuk Lakes for the remainder of the summer. Lake 10 shows a slight midsummer maximum. Kukjuktuk Bay maintains a concentration of about 10 $\mu$mol·L$^{-1}$ with very little variation throughout the summer.

SRSi concentrations in the Delta lakes and

channels (Fig. 13) are very similar early in the summer, 48–53 $\mu mol \cdot L^{-1}$. All rise to a maximum (53–59 $\mu mol \cdot L^{-1}$) by the middle of July. After that concentrations in the channels gradually drop to 48.5 $\mu mol \cdot L^{-1}$ by the end of August and then rise again to 54 $\mu mol \cdot L^{-1}$ on September 10. Concentration changes in Big Lake are similar to those in the channels but at slightly lower concentrations. Concentrations in South Lake, South Lake Bay and, after the end of July, Skidoo Lake decrease much more rapidly to minima (11–25 $\mu mol \cdot L^{-1}$) on August 29. The lowest concentration observed in the Delta occurs in South Lake Bay (9.61 $\mu mol \cdot L^{-1}$).

### $SO_4^{2-}$

Sulphate concentrations (Fig. 14) are higher in the Delta lakes (177–323 $\mu mol \cdot L^{-1}$) than in the Kukjuktuk lakes (undetectable to 101 $\mu mol \cdot L^{-1}$). In both sets of lakes concentrations rise gradually through summer with minor fluctuations in the Delta waters. Except for one sample the Kukjuktuk lakes remained ordered by concentration (10 > 18 > 14 > 28 > 7) throughout the summer. Concentrations in the Kukjuktuk lakes are very low early in the summer and increase to a maximum by the middle of July.

### $Mg^{2+}$

Magnesium concentrations (Fig. 15) in the Delta lakes rise throughout the summer to a maximum at the end of the summer. The increase in concentration is continuous except for a sharp decrease in concentration in mid-August followed by an increase to maximum concentrations reached. At any time all the concentrations of the Delta waters are within about 25 $\mu mol \cdot L^{-1}$ of each other. Early in the summer Skidoo Lake, South Lake and South Lake Bay are higher than Big Lake and the channels. Bigras (1988) observed that the temporal variations in $Mg^{2+}$ concentration are inversely related to the water levels in the Delta.

The maximum magnesium concentration observed in the Kukjuktuk lakes (270 $\mu mol \cdot L^{-1}$ in Lake 28) is approximately the minimum observed in the Delta waters. The range of concentration observed at any particular time is much greater than in the Delta. Concentrations in lakes 7, 18 and 28 are maintained within very narrow limits. Lakes 10 and 14 show a broad summer maximum similar to that observed in the DOC concentrations.

### $Ca^{2+}$

Calcium concentrations (Fig. 16) in the Kukjuktuk lakes are about half those in the Delta waters, around 400 $\mu mol \cdot L^{-1}$. Concentrations are characteristic and relatively invariant for each lake throughout the summer and the lakes remained ordered (28 > 18 > 14 > 7 > 10) in calcium concentration throughout the summer except one sample. Only lakes 7 and 14 have a common range of calcium concentrations.

At the beginning of the summer calcium concentrations in the Delta channels and Big Lake are similar (700 $\mu mol \cdot L^{-1}$). The concentrations remain similar among these water bodies throughout the summer while the concentration increases to about 760 $\mu mol \cdot L^{-1}$ by July 15 after which date they decrease gradually to the middle of August and then increase sharply to a maximum (840 $\mu mol \cdot L^{-1}$) by the end of August. Skidoo Lake, South Lake and South Lake Bay are also similar at the beginning of the summer (760 $uM \cdot L^{-1}$). By July 15 Skidoo Lake is slightly (45 $\mu mol \cdot L^{-1}$) higher in calcium than the channels and remains so for the rest of the summer. Both South Lake and South Lake Bay concentrations rise continuously to a maximum, 903 and 920 $\mu mol \cdot L^{-1}$, respectively, by the end of July. South Lake decreases slightly by the middle of August but increases again to a maximum (920 $\mu mol \cdot L^{-1}$) by end of August. Throughout the month of August the concentration in South Lake Bay decreases linearly with time to a minimum at the end of the month to nearly the concentration observed at the beginning of the summer. Bigras (1988) observed that, like the $Mg^{2+}$ ion, the temporal variations in $Ca^{2+}$ concentration

are inversely related to the water levels in the Delta.

### $Na^+$

Sodium concentrations (Fig. 17) in the Kukjuktuk lakes are higher than in the Delta lakes. Lakes 7, 14, 18 and 28 all have nearly the same pattern of changes in sodium concentration. However the Lake 7 mid-August sample is an exception with a sodium concentration that appears to be excessively high. Lakes 7, 18 and 28 (cf. $K^+$ and $Cl^-$) have very similar sodium concentrations throughout the summer, ca. 300 $\mu mol \cdot L^{-1}$, while lake 14 has a lower concentration, 229–293 $\mu mol \cdot L^{-1}$, and Lake 10 has a higher concentration, 315–470 $\mu mol \cdot L^{-1}$.

Sodium concentrations (Fig. 17) in South lake, South Lake Bay and Skidoo Lake are similar (ca. 230 $\mu mol \cdot L^{-1}$) on June 18 and increase slightly through the summer and somewhat more rapidly between August 13 and 29 to 285 $\mu mol \cdot L^{-1}$. The channels and Big Lake are lower (200 $\mu mol \cdot L^{-1}$) than the lakes on June 18. Their concentrations rise to 250 $\mu mol \cdot L^{-1}$ by the middle of July, decrease somewhat to the end of July and then increase again throughout August to 326 $\mu mol \cdot L^{-1}$ and decrease to 304 $\mu mol \cdot L^{-1}$ by September 9. These fluctuations are probably flow related similar to changes in $Ca^{2+}$ and $Mg^{2+}$ concentrations.

### $K^+$

Lake 10 has nearly twice the potassium concentration (about 55 $\mu mol \cdot L^{-1}$) (Fig. 18) of the other lakes sampled. The other Kukjuktuk lakes have concentrations in the range 22–34 $\mu mol \cdot L^{-1}$. In Lake 10 potassium concentration generally increases throughout the summer from 49–58 $\mu mol \cdot L^{-1}$. Potassium in Lake 14 decreases through the summer from 34 to 22 $\mu mol \cdot L^{-1}$ while in lakes 7, 18 and 28 it remains constant in the range 26–32 $\mu mol \cdot L^{-1}$ (cf. sodium and chloride in lakes 7, 18 and 28).

The range of potassium concentrations in the Delta lakes (Fig. 18) is similar to that observed in the Kukjuktuk lakes (Lake 10 excepted). Initially the channels and Big Lake have similar concentrations (26 $\mu mol \cdot L^{-1}$) as do Skidoo Lake , South Lake and South Lake Bay (34 $\mu mol \cdot L^{-1}$). The channels, with some small variations, remain essentially the same through the summer. South Lake and South Lake Bay show a small decrease over the summer. Potassium in Skidoo Lake decreases from the first sampling at the beginning of the the summer to concentrations just slightly higher than those of the channels and Big Lake. The pattern of potassium concentrations in the Delta lakes is remarkably similar to the pattern of DOC and calcium concentrations.

### $Cl^-$

Chloride concentrations (Fig. 19) in the Delta lakes and channels are very constant (141 $\mu mol \cdot L^{-1}$) up to the end of July. After that date concentrations are somewhat higher and more variable.

Chloride concentrations in the Kukjuktuk lakes are higher than in the Delta lakes (225–535 $\mu mol \cdot L^{-1}$). Lakes 10 and 14 have concentrations that rise from 394 to 535 $\mu mol \cdot L^{-1}$ and from 225 to 310 $\mu mol \cdot L^{-1}$, respectively, between July 1 and September 12. Concentrations in lakes 7, 18 and 28 remain relatively constant through the summer in the range 310–366 $\mu mol \cdot L^{-1}$.

Two exceptions to these patterns are observed in Kukjuktuk Lakes 7 and 14 on August 15 (493 and 352 $\mu mol \cdot L^{-1}$, respectively). These high chloride values coincide with the higher and more variable chloride values observed on August 13 in the Delta lakes. Lake 7 sodium, lakes 7 and 14 magnesium and Lake 7 sulphate concentrations of August 15 all appear to be somewhat higher than might be expected from other samples.

### Kukjuktuk Bay anions and cations

The concentrations of $Na^+$, $K^+$, $Mg^{2+}$, $Ca^{2+}$, $Cl^-$ and $SO_4^{2-}$ (Fig. 20) in this saline estuary are much higher than in the Kukjuktuk lakes and Delta waters. The concentration of these

ions are ordered $Cl^- > Na^+ > Mg^{2+} > SO_4^{2-} > K^+$, $Ca^{2+}$ as in seawater.

### Total dissolved iron (TDFe)

The maximum TDFe concentration (Fig. 21) in the Kukjuktuk lakes is observed in Lake 33 on July 1. Most observed concentrations are at or below the detection limit. Lakes 10, 14, 33 and Kukjuktuk Bay have concentrations significantly above the detection limit at least once through the summer.

In contrast to TDFe in the Kukjuktuk Lakes most TDFe concentrations (Fig. 21) in the Delta lakes and channels are above the detection limit. Maximum concentrations are observed at the beginning of the open water season in all the lakes with South Lake and South Lake Bay showing the highest concentration and the channels and Big Lake the lowest concentration while Skidoo Lake is intermediate. By July 15 all waters are similar. A second slight maximum is observed in all lakes in late August.

### Total alkalinity

Total alkalinity (Fig. 22) in the Kukjuktuk lakes is very similar to TIC in concentration and concentration changes. Total alkalinity in these lakes is ordered 28 > 18 > 14 and 7 > 10 and 33. Initially total alkalinity in Kukjuktuk Bay is similar to the DIC concentration but rises continuously through the summer whereas DIC fluctuates about a maximum after an initial increase.

Initial alkalinity patterns (Fig. 22) in the Delta are similar to FSS patterns; high concentrations in the channels and Big Lake and relatively low concentrations in South Lake, South Lake Bay and Skidoo Lake. Alkalinity in the channels and Big Lake rapidly decreases to a minimum and then, with some fluctuations, reaches a plateau in early August. Skidoo Lake increases steadily in alkalinity throughout the summer and at an increased rate after July 29. South Lake and South Lake Bay increase rapidly and continuously to a maximum on August 13 and July 29, respectively, after which date South Lake decreases slightly through the remainder of the summer while South Lake Bay decreases to early summer values by August 27 at which concentration it remains until the last sampling date.

### Organic acids

Organic acids data (Fig. 23) are available only for the early and late summer periods. Concentrations in the Delta waters are highest early in the summer at 45–85 $\mu eq \cdot L^{-1}$ and generally appear to be less in late summer. The Kukjuktuk lakes have lower concentrations than the Delta lakes, <1–34 $\mu eq \cdot L^{-1}$, on July 1 and have a similar range at the end of the summer.

### FWI pH

pH measurements made by the analytical unit of the FWI (Fig. 24) range from 8.03 to 8.54 for the Delta lakes, Boot Lake excepted (pH 7.69), while for the Kukjuktuk lakes the pH ranges from 7.69 to 8.51. The FWI pH of the Delta lakes, except for two samples on July 29 from East Channel and South Lake, show a slight midsummer maximum which is not observed in the Kukjuktuk lakes. The pH range among the Delta lakes on any given day is 0.21 pH units (June 18) or less. Each of the Kukjuktuk lakes remains within a relatively narrow pH range except Lake 10 which shows large fluctuations.

### In situ pH

The panels in Fig. 25 are plots of *in situ* pH vs time. These data have been presented by Fee et al. (1988) but are included here for comparative purposes.

### FWI specific conductance

FWI specific conductance (Fig. 26) in the Kukjuktuk Lakes is relatively constant over the summer. Each lake remains within a relatively narrow range although the overall range is wide (105–203 $\mu S \cdot cm^{-1}$).

The Delta lakes and channels are all very similar on the first sampling day after which date they quickly diverge into two groups. South Lake and South Lake Bay have higher specific conductance than the channels and Big Lake. Stations in the latter group, after an initial decrease, increase in specific conductance with a slight minimum or plateau at the end of July, while stations in the former group, South Lake and South Lake Bay, show an immediate increase in specific conductance. South Lake Bay has a maximum at the end of July. By mid-August the specific conductance in South Lake reaches a plateau at which it remains until the last sampling date. Specific conductance in Skidoo Lake also rises, but much less quickly than in the other two lakes, so that by mid-July it is slightly greater in Skidoo Lake than in the channels and Big Lake and remains so until the end of August. At that time the channels and Big Lake reach a plateau while Skidoo Lake continues to increase in specific conductance to levels above that of South Lake.

### In situ specific conductance

Figure 26 also shows a plot of *in situ* specific conductance vs time. These data have been presented by Fee et al. (1988) but are included here for comparative purposes.

## Comparisons of variables

### Suspended solids

The unfiltered suspended solids is a very small portion of the total suspended solids (TSS) as indicated by the large decrease in light extinction at 543 nm after filtration and the small decrease in light extinction after centrifugation (Tables 4, 5 and 6). The concentration of suspended solids is the major factor determining light penetration, which, in turn controls primary production, in the Delta lakes (Fee et al. 1988; Hecky and Guildford 1984). This may explain why Brunskill et al. (1973) observed a sharp increase in zoobenthos density in the Delta lakes at total suspended solids concentrations below 10–15 $mg \cdot L^{-1}$.

### Specific conductance

Specific conductances observed *in situ* may be compared with those observed at the FWI and both may be compared with specific conductances calculated from analytical results.

Specific conductances are calculated from the concentrations of major anions ($Cl^-$ and $SO_4^{2-}$), major cations ($Na^+$, $K^+$, $Ca^{2+}$ and $Mg^{2+}$), $HCO_3^-$, $CO_3^{2-}$, $OH^-$ and $H^+$. $HCO_3^-$ and $CO_3^{2-}$ are calculated from the dissolved alkalinity, (DA), (Tables 7 and 8) which is calculated as the total cationic equivalents minus total anionic equivalents. Minor ionic constituents such $NO_2^-$, $NO_3^-$, etc. are ignored. This alkalinity is assumed to be all $HCO_3^-$, $CO_3^{2-}$, with proportions governed by the pH, $OH^-$ and $H^+$. The specific conductance is calculated using limiting ionic equivalent conductances. The limiting ionic equivalent conductances at 25°C are used for calculating comparisons with the FWI specific conductance because the measurements were made at that temperature. The *in situ* temperature is used in combination with limiting ionic conductances as a function of temperature to calculate specific conductances at the *in situ* temperature. For the $HCO_3^-$ ion the conductance of a 0.001N solution rather than the limiting conductance is used. The specific conductance at the *in situ* temperature is converted to specific conductance at 25°C by using the specific conductance at 25°C in combination with the specific conductance temperature function of 0.001N KCl. The conductance data used to calculate specific conductances at 25°C are listed in Table 9.

The FWI specific conductance is measured on a sample equilibrated with atmospheric $CO_2$ and aged at least a month before the measurements are carried out at 25°C. Thus the FWI measurements are done on a sample which may be significantly different from the *in situ* situation.

Figure 27 shows the FWI specific conductance plotted vs the *in situ* specific conductance. The calculated specific conductances are also plotted vs the observed values in

Fig. 27 (observed FWI and observed *in situ*). The calculated specific conductances are in all cases higher than the observed values. This is as expected because the limiting equivalent conductances are a maximum and decrease with increasing concentration due to interionic interactions. Furthermore we have used the concentrations rather than the thermodynamic activities which are lower. Significant amounts of calcium are in a nonionized form.

The *in situ* specific conductances of the Kukjuktuk lakes are without exception lower than the FWI values by an average of 17 $\mu S \cdot cm^{-1}$ (Table 12). The calculated FWI specific conductance is greater than the observed FWI value by an average of 16 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 12) and the calculated *in situ* specific conductance is greater than the observed *in situ* value by an average of 25 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 12). In the Delta waters data subset the observed FWI specific conductance is less than the observed *in situ* value by an average of 1 $\mu S \cdot cm^{-1}$ (Fig. 27, Table 13), the calculated FWI specific conductance is greater than the observed FWI value by an average of 32 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 13) and the calculated *in situ* specific conductance is greater than the observed *in situ* value by an average of 21 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 13).

In all three comparisons in Fig. 27 the Delta data are distributed in relatively narrow bands along the 1:1 line, with some obvious outliers, plotted in upper case letters, while the Kukjuktuk data are spread over a much broader band with no obvious outliers. A strictly visual approach was used to determine whether a specific point is an outlier. These outliers are summarized in Table 14 where they have been listed in chronological order. The comparison where the outlier is found is also indicated. Most are found in more than one comparison: eight are found in only one comparison and one is found in all three comparisons. The outliers fall into four main groups. The first, group 1, contains only Big Lake, East Channel and Big Lake Channel data. This group contains all samples from these locations up to June 28 except Big Lake Channel of that date. Two samples of July 15 are also included but none of July 3. All eleven members of this group are drawn from either the FWI vs *in situ* comparison (10) or from the calculated vs FWI comparison (6). Five members of group 1 are drawn from both comparisons. There is a suggestion here that early in the year the chemistry of the channels and Big Lake is different from that of the other lakes studied and that the difference disappears by midsummer. The second group, group 2, contains all data of August 13 only and is drawn from the comparisons involving the calculated specific conductances. One may conclude that one or more of the anion and/or cation analyses is too low resulting in calculated specific conductance values that are lower than expected. The Delta $Mg^{2+}$ concentrations of August 13 appear to be too low relative to the preceding and following samples and are minima in $Mg^{2+}$ concentrations which are otherwise rising throughout the summer. The third group of outliers, group 3, is comprised of all samples of August 29 only. Because these outliers due to a known malfunction of the Hydrolab instrument all six samples are in the *in situ* comparisons as expected. One sample of August 29, South Lake Bay, is an outlier in all three comparisons. The fourth group contains only three samples two of which are of September 10 and one of July 29. By making comparisons in Fig. 27 the discrepancy causing a data point to be an outlier may be suggested and these suggestions have been coded into Table 14. There are a total of 26 outlying data points.

When the outliers listed in Table 14 are deleted from the respective comparisons for the reasons suggested in that table the mean difference between the *in situ* specific conductances and the FWI values of the Delta samples is 8 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 13, 18 deletions) and the mean difference between the calculated specific conductances and the observed FWI values is 36 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 13, 14 deletions) while the mean difference between the observed *in situ* values and the calculated *in situ* values is 19 $\mu S \cdot cm^{-1}$ (Fig. 27; Table 13, 13 deletions).

### Inorganic carbon and alkalinity

The dissolved alkalinity (DA) as calculated above is plotted vs the measured total alkalinity (TA) in Fig. 28. The dissolved alkalinities calculated for South Lake, South Lake Bay and Skidoo Lake are generally less than the observed total alkalinities. The exceptions are the data of June 23, July 29 and August 13. The opposite is true for the channels and Big Lake data with only the calculated dissolved alkalinities of August 29, September 10 and, Big Lake only on July 3 being greater than the total alkalinities. In the Kukjuktuk lakes data the calculated dissolved alkalinities are greater than the total alkalinities except on August 15 and August 27, excluding lakes 14 and 28 on the latter date, and Lake 14 on July 18 and September 12. The difference, total − dissolved alkalinity, by definition the suspended alkalinity, SA, correlates very well with FSS for the Delta samples (Fig. 29), R = 0.933, $n$ = 43 after deleting the data of August 13. The slope of this correlation yields an estimate of the ratio of suspended alkalinity to FSS, 1.57 $\mu$equiv·mg$^{-1}$. The blank, −63.9 $\mu$equiv·L$^{-1}$, probably reflects systematic errors in analyses and/or calculations. All the Delta lakes, Big Lake excepted, are clustered near the origin suggesting that there is not a large quantity of SA, and hence, SIC in these lakes while the channels and Big Lake have significant concentrations of SIC. At the average, maximum and minimum FSS concentrations (100, 314 and 15 mg·L$^{-1}$, respectively) in the Delta channels and Big Lake and at 1.57 $\mu$equiv·mg$^{-1}$ there are an estimated 221, 557 and 88 $\mu$equiv·L$^{-1}$ SIC, respectively, blank included. Converted to $\mu$moles·L$^{-1}$ these are 6.3%, 13.8% and 2.5% of the TIC concentrations in the Delta channels and Big Lake on the days that the maximum and minimum FSS ocurred (Tables 5 and 11). The mean mean TIC for the channels and Big Lake are calculated from data in Table 11.

Suspended inorganic carbon (SIC) has not been analyzed for specifically but it is known to occur in the Mackenzie Delta water (Brunskill et al. 1973).

DIC may be calculated from the dissolved alkalinity and the *in situ* pH;

$$[DIC]_{calc} = ([DA]_{calc} + [H^{+1}] - [OH^{-1}]) \cdot \left(\frac{[H^{+1}]}{K_1} + 1 + \frac{K_2}{[H^{+1}]}\right) \cdot \left(1 + \frac{2K_2}{[H^{+1}]}\right)^{-1}$$

(from Stumm and Morgan (1970)) and

$$[SIC]_{calc} = [TIC]_{obs} - [DIC]_{calc}$$

where $K_1$ and $K_2$ are the first and second dissociation constants of $H_2CO_3$ and the subscripts *calc* and *obs* refer to calculated and observed quantities, respectively.

Unlike the SA, this SIC value, when plotted vs FSS (Fig. 29) does not yield a good relationship even though there is a regular (2:1) relationship betwen SA and SIC. The mean SIC value calculated for the Delta and Kukjuktuk lakes are negative ([DIC] > [TIC]) −58 and −63 $\mu$mol·L$^{-1}$, respectively. The standard deviation for the Delta waters is 3 times that of the Kukjuktuk lakes and the range of differences, minimum to maximum, in the Delta waters is much larger than in the Kukjuktuk lakes; −490, 411 and −156, 144 $\mu$mol·L$^{-1}$.

One explanation for these discrepancies is that the suspended $CaCO_3$ does not dissolve readily in $H_2SO_4$ solution in the analytical proceedure causing variation in the results of the TIC analyses. An alternate possibility is that TIC has not been properly subsampled. The sediment in the field sample bottles will settle significantly during the time that they are in transit, up to four hours. In the laboratory TIC is the first sample to be removed from the 4L field sample bottle. These bottles are full with almost no airspace in them and therefore are difficult to mix thoroughly. TIC samples taken from the upper portion of the sample bottle will be too low in TIC, e.g. channels samples of June 8, while samples taken from the lower portion of the 4L bottle will be too high in TIC, e.g. East Channel of June 15, because the SIC fraction is unevenly distributed in the bottle. This does not seriously affect other analyses because only a small volume of

water, ≈250 mL at most or 6% of the total volume, is used for the TIC subsamples and mixing is much more thorough after the first subsampling. The variance of the Delta channels TIC has been compared to the variance of the TIC analyses of the other lakes by means of the $F_\alpha(\nu_1, \nu_2)$ statistic. The pooled variances of 28 channels and Big Lake, stations which have been found to have appreciable quantities of SA, TIC samples were compared with the variances of 27 TIC samples of the remaining lakes, excluding Boot Lake. The calculated $F = s^2_{channels}/s^2_{lakes}$ is 2.44. The tabular $F_{0.05}(27,26)$ is $\approx 1.91$. The conclusion is that the variance of the channels and Big Lake samples is greater than that of the other lakes at the 95% confidence level although the source of variation is not apparent.

To compare total alkalinity with total inorganic carbon the following conversion is made

$$[SIC]_{calc} = [SA]_{calc}/2 = ([TA]_{obs} - [DA]_{calc})/2$$

because the suspended fraction is assumed to be $CaCO_3$. The quantity $[TIC]_{calc}$ (= $[SIC]_{calc}$ + $[DIC]_{calc}$) may then be obtained and compared with the observed TIC. The comparison of calculated and observed TIC is shown graphically in Fig. 30. The TIC values calculated for the Kukjuktuk lakes are slightly greater than the observed values except the data point of August 15 of Lake 28. There are, however, no large variations within this data subset. The mean difference (observed − calculated (from TA)) is $-53\,\mu mol \cdot L^{-1}$ (SD = $40\,\mu mol \cdot L^{-1}$. The Delta data are not as simple. There are large differences between the observed TIC values and those calculated from the alkalinities. The mean difference (observed − calculated) is half again as large as the mean difference calculated for the Kukjuktuk lakes, $-87\,\mu mol \cdot L^{-1}$, and the calculated values range from being too high by $490\,\mu mol \cdot L^{-1}$ to being too low by 411 $\mu mol \cdot L^{-1}$ while the standard deviation is 153 $\mu mol \cdot L^{-1}$.

### Kukjuktuk Bay

Kukjuktuk Bay samples are a variable mixture of salt and freshwater obtained by sampling over the euphotic zone. The salt water content of the samples is between 17% and 50% of 35 per mill seawater (see Table 15). All analytical data from Kukjuktuk Bay have excess anionic equivalents (see dissolved alkalinity, Table 7) indicating that some cationic results are too low and/or that some anionic results are too high so that a charge balance would require positive ions rather than negatively charged $CO_3^{2-}$ and $HCO_3^-$ ions (Table 7).

### pH

The *in situ* pH measured in the Kukjuktuk lakes is generally higher than that measured by the FWI laboratory (Fig. 31). The exceptions are all on the first sampling day, July 1, for lakes 7, 10, 18, 28 and 33. On the first five sampling dates in the Delta all lakes have an *in situ* pH less than that measured by the FWI. On the 6th to 9th sampling dates some samples have an *in situ* pH that is greater than the FWI pH while others have an *in situ* pH that is less than the value obtained by the FWI (Fig. 31). In both the Delta and Kukjuktuk lakes the *in situ* pH increases with time relative to the FWI pH which remained relatively constant with time. The mean difference, FWI pH less the *in situ* pH, in the Delta waters decreases steadily through the summer (Fig. 31) at an overall rate of about 0.01 pH unit per day (correlation coefficient $R = 0.91, n = 10$ sampling dates, 50 data points). A similar but less pronounced, 0.007 pH unit per day, and not as well correlated ($R = 0.68, n = 6$ dates, 36 data points) pattern is observed in the Kukjuktuk Lakes. Of the samples of August 29 only one sample, that of the East Channel, has a pH less than that measured by the FWI (the difference is small, 0.14 pH unit). On the last sampling date all *in situ* pHs are higher than the FWI pH. The East Channel *in situ* pH is not available for that day. The *in situ* pH data of August 29 appear to fit into this pattern although

the Hydrolab instrument malfunctioned when measuring specific conductance.

### Chlorophyll-a

All chlorophyll-a results except one (Big Lake on July 19) obtained at the Inuvik laboratory are consistently higher than the results obtained by the FWI laboratory (Fig. 32). When the FWI results are plotted vs the Inuvik data all but six data pairs are contained within an envelope that includes the origin and becomes wider at higher concentration. The regression of FWI chlorophyll-a on Inuvik chlorophyll-a has a slope of 0.629 with intercept $0.093\,\mu g \cdot L^{-1}$, 95 data pairs were used. The correlation coefficient is 0.938 (see Fig. 32).

The disagreement in the chlorophyll-a analyses has implications for all chlorophyll-a analyses done in this manner and must be resolved. The differences in treatment in the two chlorophyll-a data sets are: 1) storage in a freezer at Inuvik and 2) shipment to the FWI in a darkened container; the effects of these variations must be investigated. The use of $MgCO_3$ suspension as a preservative as suggested by Strickland and Parsons (1972) and Golterman (1969) should be investigated. Alternate methods of storing and shipping, e.g. drying, should also be investigated.

### Molar ratios of suspended P, N and C

Molar ratios of SN/SP and TSC/SP vary more in the Delta lakes than in the Kukjuktuk lakes (Tables 12 and 13). Ratios of SN/SP range from 1 to 10 in the channels and Big Lake and from 4 to 43 in the other Delta lakes while TSC/SP ratios vary from 40 to 167 in the Delta waters. Ratios in South Lake and South Lake Bay tend to be higher than in the channels. In the Kukjuktuk lakes these ratios are between 14 and 22 for SN/SP and between 106 and 193 for TSC/SP. Kukjuktuk Bay ratios are less variable, 12–15 and 103–119 for SN/SP and TSC/SP, respectively. In Kukjuktuk Bay and the Delta waters the mean TSC/SP ratio is 111 and 104, respectively, while the mean SN/SP ratios are 14 and 10, respectively (Tables 12 and 13). In the Kukjuktuk lakes ratios of SN/SP and TSC/SP are 18 and 147, respectively. The ratio of P:N:C in the composition of plankton organisms is known as the Redfield ratio. There is no exact value but Kramer et al. (1972) suggest a ratio of 1:16:106 while Broecker and Peng (1982) suggest a ratio 1:16:105. These ratios can vary up or down depending on the nutrient status of the phytoplankton (Healey and Hendzel 1980). Since these suspended nutrient fractions are relatively invariant in the Kukjuktuk lakes and show strong correlations with chlorophyll-a and FSS (see correlation coefficients in the next section) it appears that the bulk of suspended material in these lakes is algal material. In the Delta waters this is not so as shown by the large variations in SN/SP and TSC/SP ratios (Tables 8 and 13) and the negative and weaker correlation of SN, SP and TSC concentrations with chlorophyll-a concentration (see correlation coefficients in the next section). The high ratios of TSC/SN (Table 8) in the Delta channels and Big Lake, 21, suggest that this material is not recently living and may have been largely derived from terrestrial vegetation. The TSC/SN ratios of the Delta will also be affected by suspended inorganic carbon. The opposite is observed in Kukjuktuk Bay and the Kukjuktuk lakes. The mean ratio of TSC/SN is similar in the Kukjuktuk lakes and the Delta lakes, $\approx 9$, but it is more variable in the Delta lakes.

### Miscellaneous

SRSi and TDP decreased over the summer in all the freshwater lakes studied but increased in the Kukjuktuk Bay waters as salinity increased. The ratios of concentration of SRSi:$Ca^{2+}$:TIC in South Lake Bay decreased at the rate 1:5:15 during the month of August.

The simultaneous decrease in TIC and $Ca^{2+}$ in South Lake Bay in the ratio 3:1 (TIC:$Ca^{2+}$) between July 29 and August 29 along with the simultaneous increase in pH, from 7.8 on July

3 to 9.3 on August 29, suggest biogenic precipitation of $CaCO_3$.

An interesting difference between the Kukjuktuk and Delta lakes appears when TIC is plotted vs pH (Fig. 33). The symbols represent the measured TIC and *in situ* pH of the Delta (letters) and Kukjuktuk (numbers) lakes, respectively. The two data sets are divided by the lines which are the calculated saturation concentrations of DIC in water as a function of pH at 0°C and 25°C at atmospheric $CO_2$ pressure ($10^{-3.5}$ atm). This is a comparison of TIC of the two sets of lakes to dissolved inorganic carbon of water at the given pH in equilibrium with the atmosphere.

## Conclusions

The most striking difference between lakes in the Kukjuktuk Bay study area and the lakes and channels in the Mackenzie Delta is the large quantity of suspended solids in the latter; 1–6 $mg \cdot L^{-1}$ in the Kukjuktuk lakes compared to 3–314 $mg \cdot L^{-1}$ in the Delta lakes.

Changes in the pH and specific conductance data suggest that generally the Delta waters are oversaturated in $CO_2$ and the lakes in the Kukjuktuk Bay study area are undersaturated in $CO_2$. Increased $CO_2$ concentration causes a decrease in pH and a corresponding increase in specific conductance while a release of $CO_2$ causes changes in the opposite direction. This is supported by the distribution of data points in the plot of TIC vs pH (Fig. 33). The Delta channels and Big Lake appear to change from undersaturated in $CO_2$ early in the season to oversaturated, like the other Delta lakes, later in the season.

The Kukjuktuk lakes are distinct from the Delta lakes in specific conductance, $Ca^{2+}$, $Mg^{2+}$, $Cl^-$, TIC, SRSi, FSS, TDFe and alkalinity. DOC and $K^+$ are similar in the Delta waters and Kukjuktuk lakes (Lake 10 excepted). The Kukjuktuk lakes have concentrations of anions and cations that are characteristic of each lake and do not vary greatly over the summer.

The Delta waters may be conveniently described as channels (East Channel and Big Lake Channel) and lakes (South Lake and South Lake Bay). Skidoo Lake and Big Lake can be described as intermediate between these two extremes.

The chemistry of the Delta lakes is more variable in time than that of the Kukjuktuk lakes. East Channel and Big Lake Channel are very similar to each other. South Lake Bay was the most variable exhibiting large changes in TIC, pH, $Ca^{2+}$ and SRSi. South Lake is very similar to South Lake Bay in DOC, FSS and chlorophyll-a. They are distinguished by the behaviour of the $Ca^{2+}$ and TIC concentrations. Skidoo Lake and Big Lake have characteristics of both the channels and the lakes. TDP, $Na^+$, $SO_4^{2-}$ and $Mg^{2+}$ are very similar in all Delta waters and the water is not readily characterized by them as lake or channel water.

Boot Lake is influenced by drainage from the Caribou Hills, the town of Inuvik and the East Channel. Although only one duplicate sample is available some comparisons may be made. Boot Lake is similar to the Delta channels in FWI pH, $Ca^{2+}$ and TIC while it is more like the Kukjuktuk lakes in specific conductance, $Na^+$, $Cl^-$, FSS, $Mg^{2+}$ and SRSi. The much higher concentrations of TDP and DOC in Boot Lake compared to the Kukjuktuk or Delta lakes may indicate the anthropogenic influence of nearby Inuvik.

Macrophyte primary production probably caused the high pH observed in the Kukjuktuk lakes and the increase in pH in South Lake Bay between July 5 and August 29 because these lakes have abundant growths of macrophytes while algal production is probably too low to cause the observed increase in pH (Fee et al. 1988). The increase in pH in South Lake Bay in July follows the increased transparency in June (Fee et al. 1988).

Chlorophyll-a is positively correlated with FSS in the Kukjuktuk lakes R=0.873, (n=26), while the correlation is negative in the Delta lakes −0.636 (50). The number of data points is given in parentheses. Correlation coefficients between chlorophyll-a and SN, SP and TSC are

0.884 (31), 0.952 (31) and 0.931 (31) in the Kukjuktuk lakes. Correlations between these variables in the Delta are negative and not as strong, −0.407 (54), −0.602 (57) and −0.530 (54), respectively.

As expected, there are strong positive correlations between FSS and SN, SP and TSC in both the Kukjuktuk and Delta lakes; R=0.82 (47), 0.98 (50) and 0.95 (47), respectively, for the Delta lakes and R=0.89 (26), 0.92 (26) and 0.92 (26), respectively, for the Kukjuktuk lakes.

The presence of suspended inorganic carbon (SIC) in the Delta channels should be considered in the evaluation of primary production data. During photosynthesis phytoplankton use primarily $HCO_3^-$ which, in practice, is obtained from DIC data. The TIC data available here includes DIC along with any SIC present. SIC is indistinguishable from $CO_2$, $CO_3^{2-}$ and $HCO_3^-$ in the TIC analysis and its presence will cause an overestimation of DIC. Due to analytical or subsampling problems in the TIC analysis the best estimates of SIC are obtained from the suspended alkalinities (SA/2).

With some exceptions the analytical results appear to be consistent internally as well as externally with physicochemical parameters that are measured *in situ* and at the FWI. The exceptions are mainly those of August 13 and 15. More important are the discrepancies in the chlorophyll-a and the total inorganic carbon analyses. Samples with large amounts of suspended matter should be mixed mechanically before subsampling for TIC. There appears to be some systematic error in the difference, total alkalinity − dissolved alkalinity, either the total alkalinity is too low and/or the dissolved alkalinity is too high.

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Table 1. Subsamples prepared in the Inuvik laboratory for analysis by the analytical unit of the FWI. Analytical methods are those of Stainton et al. (1977).

| Subsample | Container | Volume | Treatment | Preservative | Analyses Done |
|---|---|---|---|---|---|
| alkalinity | PE* | 125 | unfiltered | none | FWI sp. conductance<br>Total alkalinity<br>FWI pH SRSi |
| Anions | " | 60 | filtered | " | $SO4^{2-}$ $Cl^-$ |
| Cations | " | " | " | 200 µL 3M HCl | $Na^+$, $K^+$, $Mg^{2+}$<br>TDFe $Ca^{2+}$ |
| DOC | glass | 20 | " | 50 µL saturated $HgCl_2$ | dissolved organic carbon |
| TDP | " | " | " | 100 µL 4N $H_2SO_4$ (ultrex) | total dissolved nitrogen and total dissolved phosphorus |
| SNC | filter | - | - | dried and frozen | suspended nitrogen<br>suspended carbon |
| SP | " | - | - | frozen | suspended phosphorus |
| Chloro | " | - | - | frozen | chlorophyll-a |

* PE = polyethylene

Table 2. Factors used to convert mass units, mg or µg, to µmolar units for the species and units listed.

| Species | | | Divide by | Multiply by |
|---|---|---|---|---|
| SN | TDN | µg/L | 14.00 | 1 |
| SP | TDP | " | 30.97 | 1 |
| SC | | " | 12.01 | 1 |
| SRSi | | mg/L | 28.10 | 1000 |
| Cl | | " | 35.45 | 1000 |
| $SO_4$ | | " | 96.10 | 1000 |
| Na | | " | 23.00 | 1000 |
| K | | " | 39.10 | 1000 |
| Ca | | " | 40.08 | 1000 |
| Mg | | " | 24.31 | 1000 |
| TDFe | | " | 55.85 | 1000 |

Table 3. Blanks prepared in Inuvik in 1985 for analysis by the analytical unit of the FWI. The "Late blanks" were analyzed three months after the other blanks (see text).

| Anal # | B | Date | # of day | SN µmol/disc | TDN µmol/L | SP µmol/disc | TDP µmol/L | TSC µmol/disc | FSS mg/disc |
|---|---|---|---|---|---|---|---|---|---|
| 4 | Blank B1-3 | 15-Jun | 166 | NA | NA < 0.032 | | NA | NA | NA |
| 11 | Blank B5-10 | 18-Jun | 169 | 0.14 | NA < 0.032 | | NA | 2.50 | NA |
| 18 | Blank B12-17 | 23-Jun | 174 | < 0.07 | NA | 0.035 | NA | 0.83 | NA |
| 26 | Blank B20-25 | 28-Jun | 179 | < 0.07 | NA < 0.032 | | NA | < 0.83 | NA |
| 33 | Blank B27-32 | 01-Jul | 182 | 0.07 | NA < 0.032 | | NA | 1.67 | NA |
| 43 | Blank B37-42 | 03-Jul | 184 | < 0.07 | NA < 0.032 | | NA | 0.83 | NA |
| 52 | Blank B46-51 | 15-Jul | 196 | < 0.07 | NA < 0.032 | | NA | < 0.83 | NA |
| 59 | Blank B53-58 | 18-Jul | 199 | 0.29 | NA < 0.032 | | NA | 4.17 | NA |
| 75 | Blank B69-74 | 29-Jul | 210 | < 0.07 | NA < 0.032 | | NA | 2.50 | NA |
| 82 | Blank B76-81 | 31-Jul | 212 | < 0.07 | NA < 0.032 | | NA | 1.67 | NA |
| 95 | Blank B89-94 | 13-Aug | 225 | 0.07 | 7.14 < 0.032 | | 0.129 | 1.67 | NA |
| 102 | Blank B96-101 | 15-Aug | 227 | < 0.07 | 2.86 < 0.032 | | 0.129 | 2.50 | NA |
| 112 | Blank B105-111 | 27-Aug | 239 | 0.07 | 2.86 < 0.032 | | 0.161 | 1.67 | NA |
| 121 | Blank B114-120 | 29-Aug | 241 | 0.14 | 2.14 < 0.032 | | 0.129 | 1.67 | < 1 |
| 141 | Blank B133-140 | 10-Sep | 253 | < 0.07 | 3.57 < 0.032 | | 0.097 | 1.67 | < 1 |
| 150 | Blank B144-149 | 12-Sep | 255 | < 0.07 | 3.57 < 0.032 | | 0.129 | 1.67 | NA |
| 154 | Late blank TDN | B4 | 15-Jun | 166 | NA | > 143 | NA | 0.226 | NA NA |
| 155 | Late blank TDN | B11 | 18-Jun | 169 | NA | > 143 | NA | 0.194 | NA NA |
| 156 | Late blank TDN | B18 | 23-Jun | 174 | NA | > 143 | NA | 0.226 | NA NA |
| 157 | Late blank TDN | B26 | 28-Jun | 179 | NA | 130 | NA | 0.226 | NA NA |
| 158 | Late blank TDN | B33 | 01-Jul | 182 | NA | > 143 | NA | 0.226 | NA NA |
| 159 | Late blank TDN | B43 | 03-Jul | 184 | NA | > 143 | NA | 0.194 | NA NA |
| 160 | Late blank TDP | B4 | 15-Jun | 166 | NA | > 143 | NA | 0.258 | NA NA |
| 161 | Late blank TDP | B11 | 18-Jun | 169 | NA | 22.9 | NA | 0.226 | NA NA |
| 162 | Late blank TDP | B18 | 23-Jun | 174 | NA | 43.6 | NA | 0.226 | NA NA |
| 163 | Late blank TDP | B26 | 28-Jun | 179 | NA | > 143 | NA | 0.290 | NA NA |
| 164 | Late blank TDP | B33 | 01-Jul | 182 | NA | > 143 | NA | 0.194 | NA NA |
| 165 | Late blank TDP | B43 | 03-Jul | 184 | NA | 14.3 | NA | 0.194 | NA NA |
| 166 | Late blank TDP | B102 | 15-Aug | 227 | NA | 27.1 | NA | 0.194 | NA NA |
| 167 | Late blank TDP | B112 | 27-Aug | 239 | NA | 23.6 | NA | 0.194 | NA NA |
| 168 | Late blank TDP | B121 | 29-Aug | 241 | NA | 27.9 | NA | 0.226 | NA NA |
| 169 | Late blank TDP | B141 | 10-Sep | 253 | NA | 12.1 | NA | 0.194 | NA NA |
| 170 | Late blank TDP | B150 | 12-Sep | 255 | NA | | | | |
| | Blanks | maximum | | | 0.29 | 7.14 | 0.035 | 0.161 | 4.17 < 1 |
| | | minimum | | | < 0.07 | 2.14 | < 0.032 | 0.097 | 0.83 < 1 |
| | | mean | | | < 0.10 | 3.69 | < 0.032 | 0.129 | < 1.78 < 1 |
| | | Standard deviation | | | < 0.058 | 1.774 | < 0.0008 | 0.0204 | < 0.883 0 |
| | | n | | | 15 | 6 | 16 | 6 | 15 2 |
| | Late blanks TDN/TDP | maximum | | | | > 143 | | 0.290 | |
| | | minimum | | | | 12.14 | | 0.194 | |
| | | mean | | | | > 93 | | 0.218 | |
| | | Standard deviation | | | | > 60 | | 0.0268 | |
| | | n | | | | 17 | | 17 | |

Table 4. Chemistry and water quality data for the Kukjuktuk lakes and Kukjuktuk Bay in the Kukjuktuk Bay study area.

| Station number | Anal # | B- LOCATION** | Date 1985 | # of day | SN µmol/L | TDN µmol/L | SP µmol/L | TDP µmol/L | DOC µmol/L | TSC µmol/L | SRSi µmol/L | Cl µmol/L | SO4 µmol/L | FSS mg/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | TDFe µmol/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 27 | KUK LAKE 10 | 01-Jul | 182 | 8.6 | NA | 0.594 | 0.387 | 410 | 69.9 | 0.57 | 395 | 31 | NA | 315 | 49 | 254 | 155 | 1.25 |
| 53 | 54 | KUK LAKE 10 | 18-Jul | 199 | 15.1 | NA | 1.085 | 0.387 | 530 | 146.5 | 1.21 | 423 | 73 | 6 | 370 | 55 | 294 | 202 | 1.25 |
| 69 | 77 | KUK LAKE 10 | 31-Jul | 212 | 12.8 | NA | 0.685 | 0.387 | 540 | 101.6 | 1.81 | 494 | 92 | 4 | 398 | 57 | 309 | 216 | < 0.72 |
| 85 | 97 | KUK LAKE 10 | 15-Aug | 227 | 10.3 | NA | 0.581 | 0.484 | 550 | 77.4 | 1.92 | 536 | 94 | 4 | 372 | 58 | 297 | 217 | < 0.72 |
| 97 | 109 | KUK LAKE 10 | 27-Aug | 239 | 13.1 | NA | 0.607 | 0.387 | 480 | 89.9 | 1.78 | 508 | 94 | 3 | 413 | 54 | 324 | 198 | 0.72 |
| 107 | 174 | KUK LAKE 10 | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 119 | 145 | KUK LAKE 10 | 12-Sep | 255 | 9.8 | NA | 0.465 | 0.355 | 490 | 74.9 | 1.25 | 536 | 94 | 4 | 470 | 57 | 342 | 218 | 0.72 |
| 31 | 28 | KUK LAKE 18 | 01-Jul | 182 | 5.5 | NA | 0.375 | 0.258 | 360 | 47.5 | 4.95 | 310 | 21 | NA | 272 | 28 | 422 | 205 | 0.72 |
| 54 | 55 | KUK LAKE 18 | 18-Jul | 199 | 6.6 | NA | 0.452 | 0.323 | 450 | 50.0 | 2.46 | 353 | 35 | 2 | 310 | 31 | 462 | 232 | 0.72 |
| 70 | 78 | KUK LAKE 18 | 31-Jul | 212 | 6.1 | NA | 0.349 | 0.291 | 440 | 48.3 | 1.39 | 353 | 39 | 2 | 317 | 31 | 467 | 235 | < 0.72 |
| 86 | 98 | KUK LAKE 18 | 15-Aug | 227 | 6.0 | NA | 0.362 | 0.387 | 490 | 47.5 | 1.81 | 409 | 42 | 2 | 300 | 29 | 447 | 225 | 0.72 |
| 96 | 108 | KUK LAKE 18 | 27-Aug | 239 | 6.0 | NA | 0.349 | 0.323 | 400 | 48.3 | 1.42 | 367 | 44 | 2 | 330 | 27 | 472 | 231 | 0.72 |
| 108 | 175 | KUK LAKE 18 | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 120 | 146 | KUK LAKE 18 | 12-Sep | 255 | 4.6 | NA | 0.258 | 0.226 | 410 | 35.8 | 1.42 | 339 | 45 | 1 | 327 | 31 | 467 | 232 | 0.72 |
| 32 | 29 | KUK LAKE 14 | 01-Jul | 182 | 6.6 | NA | 0.478 | 0.355 | 340 | 50.8 | 5.94 | 226 | 21 | NA | 229 | 34 | 324 | 160 | 0.72 |
| 55 | 56 | KUK LAKE 14 | 18-Jul | 199 | 5.5 | NA | 0.284 | 0.323 | 480 | 41.6 | 1.46 | 282 | 30 | 1 | 259 | 32 | 362 | 188 | 0.72 |
| 71 | 79 | KUK LAKE 14 | 31-Jul | 212 | 6.1 | NA | 0.310 | 0.323 | 420 | 46.6 | 1.28 | 282 | 32 | 2 | 261 | 30 | 369 | 194 | < 0.72 |
| 88 | 100 | KUK LAKE 14 | 15-Aug | 227 | 7.4 | NA | 0.400 | 0.452 | 500 | 55.8 | 1.74 | 367 | 31 | 3 | 269 | 24 | 349 | 212 | 0.72 |
| 94 | 106 | KUK LAKE 14 | 27-Aug | 239 | 6.5 | NA | 0.336 | 0.387 | 400 | 47.5 | 2.28 | 310 | 32 | 2 | 293 | 23 | 369 | 188 | 1.43 |
| 110 | 177 | KUK LAKE 14 | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 122 | 148 | KUK LAKE 14 | 12-Sep | 255 | 6.6 | NA | 0.349 | 0.323 | 390 | 52.5 | 1.17 | 310 | 32 | 2 | 287 | 23 | 369 | 194 | 0.72 |
| 34 | 31 | KUK LAKE 28 | 01-Jul | 182 | 4.3 | NA | 0.258 | 0.226 | 470 | 40.8 | 2.49 | 367 | < 10 | 2 | 318 | 32 | 584 | 274 | 0.72 |
| 57 | 58 | KUK LAKE 28 | 18-Jul | 199 | 4.0 | NA | 0.220 | 0.323 | 520 | 35.8 | 1.92 | 353 | 19 | 1 | 310 | 30 | 564 | 274 | 0.72 |
| 73 | 81 | KUK LAKE 28 | 31-Jul | 212 | 3.7 | NA | 0.168 | 0.226 | 510 | 32.5 | 1.25 | 353 | 19 | 1 | 314 | 30 | 554 | 277 | < 0.72 |
| 89 | 101 | KUK LAKE 28 | 15-Aug | 227 | 4.1 | NA | 0.207 | 0.323 | 540 | 34.1 | 1.39 | 437 | 16 | 1 | 312 | 30 | 524 | 256 | 0.72 |
| 93 | 105 | KUK LAKE 28 | 27-Aug | 239 | 3.4 | NA | 0.168 | 0.291 | 470 | 26.6 | 1.78 | 395 | 19 | 1 | 344 | 29 | 564 | 261 | < 0.72 |
| 111 | 178 | KUK LAKE 28 | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 123 | 149 | KUK LAKE 28 | 12-Sep | 255 | 3.1 | NA | 0.142 | 0.226 | 420 | 27.5 | 1.74 | 367 | 20 | 1 | 349 | 31 | 551 | 267 | 0.72 |
| 35 | 32 | KUK LAKE 7 | 01-Jul | 182 | 5.0 | NA | 0.310 | 0.258 | 400 | 44.1 | 2.88 | 310 | < 10 | NA | 279 | 29 | 362 | 194 | 0.72 |
| 56 | 57 | KUK LAKE 7 | 18-Jul | 199 | 8.0 | NA | 0.413 | 0.323 | 510 | 65.8 | 1.35 | 353 | 17 | 2 | 296 | 31 | 362 | 199 | 0.72 |
| 72 | 80 | KUK LAKE 7 | 31-Jul | 212 | 8.9 | NA | 0.426 | 0.291 | 510 | 66.6 | 1.17 | 353 | 17 | 2 | 294 | 29 | 362 | 202 | < 0.72 |
| 87 | 99 | KUK LAKE 7 | 15-Aug | 227 | 7.5 | NA | 0.387 | 0.420 | 560 | 60.8 | 1.46 | 522 | 21 | 2 | 400 | 32 | 339 | 226 | < 0.72 |
| 95 | 107 | KUK LAKE 7 | 27-Aug | 239 | 6.4 | NA | 0.297 | 0.323 | 470 | 48.3 | 1.25 | 353 | 16 | 1 | 319 | 28 | 359 | 194 | 0.72 |
| 109 | 176 | KUK LAKE 7 | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 121 | 147 | KUK LAKE 7 | 12-Sep | 255 | 5.9 | NA | 0.323 | 0.258 | 460 | 47.5 | 1.42 | 339 | 16 | 1 | 330 | 31 | 359 | 198 | 0.72 |
| 52 | 53 | KUK BAY | 18-Jul | 199 | 3.4 | NA | 0.245 | 0.387 | 120 | 29.1 | 7.51 | 81805 | 6243 | 4 | 70000 | 2097 | 1946 | 8145 | 0.72 |
| 68 | 76 | KUK BAY | 31-Jul | 212 | 3.7 | NA | 0.284 | 0.387 | 260 | 31.6 | 8.51 | 115656 | 7284 | 3 | 92174 | 2251 | 2323 | 10654 | < 0.72 |
| 84 | 96 | KUK BAY | 15-Aug | 227 | 5.4 | NA | 0.362 | 0.452 | 320 | 40.8 | 8.68 | 110014 | 7284 | 6 | 83913 | 2072 | 2545 | 10366 | < 0.72 |
| 98 | 110 | KUK BAY | 27-Aug | 239 | 4.9 | NA | 0.323 | 0.452 | 310 | 35.8 | 10.32 | 112835 | 8325 | 5 | 91304 | 2813 | 2670 | 11065 | 0.72 |
| 106 | 173 | KUK BAY | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 118 | 144 | KUK BAY | 12-Sep | 255 | 3.8 | NA | 0.323 | 0.581 | 300 | 33.3 | 9.25 | 239774 | 10948 | 7 | 182174 | 6113 | 4716 | 21349 | 1.43 |

Table 4. Cont. (page 2 of 2).

| Station number | Anal # | B- | LOCATION** | Date 1985 | # of day | Inuvik TIC | Total Alkal µeq/L | Organic acid µeq/L | pH at 25C | | Sp conductance at 25C µS/cm | | Chlorophyll-a µg/L | | In situ temp C | 10 cm absorbance at* | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | 455 nm | 543 nm | | |
| | | | | | | | | | FWI | In situ | FWI | In situ | FWI | Inuvik | | F & C | UF | F | F & C |
| 30 | 27 | KUK | LAKE 10 | 01-Jul | 182 | 706 | 690 | 34 | 7.87 | 7.8 | 125 | 112 | 4.3 | 6.9 | 11.6 | 0.012 | 0.057 | 0.007 | 0.001 |
| 53 | 54 | KUK | LAKE 10 | 18-Jul | 199 | 699 | 750 | NA | 8.30 | 8.3 | 156 | 125 | 7.3 | 11.6 | 6.8 | 0.011 | 0.090 | 0.010 | 0.001 |
| 69 | 77 | KUK | LAKE 10 | 31-Jul | 212 | 705 | 780 | NA | 7.69 | 8.3 | 152 | 133 | 4.1 | 5.5 | 9.6 | 0.015 | 0.079 | 0.010 | 0.005 |
| 85 | 97 | KUK | LAKE 10 | 15-Aug | 227 | 744 | 800 | NA | 8.27 | 8.3 | 157 | 134 | 3.8 | 6.1 | 9.4 | 0.020 | 0.068 | 0.011 | 0.008 |
| 97 | 109 | KUK | LAKE 10 | 27-Aug | 239 | 783 | 830 | NA | 8.04 | 8.9 | 153 | 138 | 3.5 | 5.8 | 7.2 | 0.020 | 0.060 | 0.006 | 0.003 |
| 107 | 174 | KUK | LAKE 10 | 07-Sep | 250 | 790 | NA | NA | NA | 7.9 | NA | 140 | NA | NA | 4.3 | NA | NA | NA | NA |
| 119 | 145 | KUK | LAKE 10 | 12-Sep | 255 | 844 | 850 | 35 | 7.93 | 8.2 | 170 | 146 | 3.1 | 5.3 | 4.2 | 0.020 | 0.085 | 0.010 | 0.007 |
| 31 | 28 | KUK | LAKE 18 | 01-Jul | 182 | 1159 | 1140 | 14 | 8.06 | 7.9 | 154 | 132 | 2.6 | 3.4 | 4.5 | 0.005 | 0.051 | 0.008 | -0.002 |
| 54 | 55 | KUK | LAKE 18 | 18-Jul | 199 | 1185 | 1260 | NA | 8.24 | 8.5 | 169 | 160 | 2.1 | 3.2 | 7.7 | 0.003 | 0.049 | 0.000 | -0.002 |
| 70 | 78 | KUK | LAKE 18 | 31-Jul | 212 | 1270 | 1290 | NA | 7.97 | 8.6 | 172 | 159 | 1.9 | 2.6 | 10.0 | 0.007 | 0.056 | 0.003 | 0.002 |
| 86 | 98 | KUK | LAKE 18 | 15-Aug | 227 | 1229 | 1310 | NA | 8.38 | 8.6 | 175 | 154 | 2.2 | 3.2 | 10.0 | 0.012 | 0.054 | 0.007 | 0.003 |
| 96 | 108 | KUK | LAKE 18 | 27-Aug | 239 | 1220 | 1320 | 24 | 8.21 | 9.2 | 167 | 155 | 2.3 | 3.9 | 7.8 | 0.011 | 0.050 | 0.003 | 0.002 |
| 108 | 175 | KUK | LAKE 18 | 07-Sep | 250 | 1197 | NA | NA | NA | 8.3 | NA | 154 | NA | NA | 5.2 | NA | NA | NA | NA |
| 120 | 146 | KUK | LAKE 18 | 12-Sep | 255 | 1194 | 1270 | 13 | 8.20 | 8.7 | 176 | 157 | 1.9 | 3.1 | 4.8 | 0.011 | 0.048 | 0.007 | 0.005 |
| 32 | 29 | KUK | LAKE 14 | 01-Jul | 182 | 899 | 930 | 1 | 7.89 | 8.1 | 126 | 108 | 3.2 | 4.9 | 11.1 | 0.008 | 0.045 | 0.022 | 0.000 |
| 55 | 56 | KUK | LAKE 14 | 18-Jul | 199 | 928 | 1060 | NA | 8.15 | 8.7 | 143 | 123 | 1.5 | 2.5 | 7.7 | 0.005 | 0.025 | 0.005 | -0.001 |
| 71 | 79 | KUK | LAKE 14 | 31-Jul | 212 | 1020 | 1020 | NA | 7.93 | 8.6 | 139 | 122 | 1.9 | 2.6 | 9.8 | 0.012 | 0.053 | 0.007 | 0.004 |
| 88 | 100 | KUK | LAKE 14 | 15-Aug | 227 | 961 | 1070 | NA | 8.17 | 8.8 | 144 | 122 | 2.4 | 3.5 | 9.6 | 0.017 | 0.055 | 0.010 | 0.005 |
| 94 | 106 | KUK | LAKE 14 | 27-Aug | 239 | 1000 | 1050 | 19 | 8.10 | 8.4 | 141 | 122 | 1.9 | 3.4 | 7.6 | 0.020 | 0.045 | 0.007 | 0.005 |
| 110 | 177 | KUK | LAKE 14 | 07-Sep | 250 | 896 | NA | NA | NA | 9.0 | NA | 117 | NA | NA | 4.7 | NA | NA | NA | NA |
| 122 | 148 | KUK | LAKE 14 | 12-Sep | 255 | 996 | 1070 | < 1 | 7.96 | 8.4 | 146 | 124 | 2.8 | 4.4 | 4.7 | 0.015 | 0.065 | 0.010 | 0.007 |
| 34 | 31 | KUK | LAKE 28 | 01-Jul | 182 | 1605 | 1630 | 15 | 8.51 | 8.1 | 203 | 197 | 1.7 | 2.0 | 7.5 | 0.007 | 0.035 | 0.007 | 0.000 |
| 57 | 58 | KUK | LAKE 28 | 18-Jul | 199 | 1495 | 1590 | NA | 8.36 | 8.7 | 196 | 195 | 1.0 | 1.8 | 8.5 | 0.002 | 0.025 | -0.002 | -0.003 |
| 73 | 81 | KUK | LAKE 28 | 31-Jul | 212 | 1527 | 1590 | NA | 8.14 | 8.6 | 196 | 188 | 1.1 | 1.6 | 10.0 | 0.005 | 0.033 | 0.002 | 0.001 |
| 89 | 101 | KUK | LAKE 28 | 15-Aug | 227 | 1581 | 1600 | NA | 8.33 | 8.4 | 197 | 180 | 1.2 | 2.0 | 10.4 | 0.010 | 0.035 | 0.005 | 0.004 |
| 93 | 105 | KUK | LAKE 28 | 27-Aug | 239 | 1464 | 1590 | 15 | 8.26 | 8.9 | 187 | 181 | 1.0 | 1.8 | 8.7 | 0.010 | 0.020 | 0.003 | 0.001 |
| 111 | 178 | KUK | LAKE 28 | 07-Sep | 250 | 1483 | NA | NA | NA | 8.3 | NA | 178 | NA | NA | 6.5 | NA | NA | NA | NA |
| 123 | 149 | KUK | LAKE 28 | 12-Sep | 255 | 1453 | 1560 | 8 | 8.23 | 8.6 | 197 | 183 | 1.1 | 1.8 | 6.1 | 0.010 | 0.031 | 0.008 | 0.005 |
| 35 | 32 | KUK | LAKE 7 | 01-Jul | 182 | 1077 | 1040 | 4 | 8.03 | 7.9 | 145 | 120 | 1.8 | 2.5 | 3.8 | 0.005 | 0.025 | 0.003 | -0.001 |
| 56 | 57 | KUK | LAKE 7 | 18-Jul | 199 | 1019 | 1010 | NA | 8.21 | 8.6 | 136 | 130 | 2.9 | 5.0 | 8.0 | 0.004 | 0.027 | 0.001 | -0.002 |
| 72 | 80 | KUK | LAKE 7 | 31-Jul | 212 | 1035 | 1040 | NA | 7.97 | 8.4 | 144 | 128 | 3.0 | 4.1 | 10.0 | 0.010 | 0.039 | 0.004 | 0.003 |
| 87 | 99 | KUK | LAKE 7 | 15-Aug | 227 | 1001 | 1060 | NA | 8.09 | 8.5 | 145 | 124 | 3.0 | 4.4 | 10.2 | 0.015 | 0.035 | 0.009 | 0.006 |
| 95 | 107 | KUK | LAKE 7 | 27-Aug | 239 | 1000 | 1080 | 12 | 8.10 | 9.0 | 142 | 125 | 2.1 | 3.5 | 7.7 | 0.018 | 0.035 | 0.005 | 0.003 |
| 109 | 176 | KUK | LAKE 7 | 07-Sep | 250 | 1027 | NA | NA | NA | 8.1 | NA | 122 | NA | NA | 5.4 | NA | NA | NA | NA |
| 121 | 147 | KUK | LAKE 7 | 12-Sep | 255 | 1019 | 1070 | 7 | 8.06 | 8.4 | 147 | 126 | 2.4 | 3.9 | 5.0 | 0.012 | 0.038 | 0.010 | 0.007 |
| 52 | 53 | KUK | BAY | 18-Jul | 199 | 1194 | 1220 | NA | 8.24 | 8.4 | 9050 | 10100 | 0.5 | 0.9 | 6.1 | 0.005 | 0.065 | 0.002 | -0.002 |
| 68 | 76 | KUK | BAY | 31-Jul | 212 | 1643 | 1510 | NA | 8.08 | 8.3 | 10100 | 10900 | 0.9 | 1.3 | 8.1 | 0.011 | 0.063 | 0.010 | 0.003 |
| 84 | 96 | KUK | BAY | 15-Aug | 227 | 1796 | 1700 | NA | 8.33 | 8.4 | 11200 | 11800 | 1.2 | 1.9 | 8.5 | 0.017 | 0.103 | 0.008 | 0.005 |
| 98 | 110 | KUK | BAY | 27-Aug | 239 | 1653 | 1780 | < 1 | 8.16 | 8.5 | 12500 | 12840 | 1.0 | 1.5 | 6.5 | 0.020 | 0.083 | 0.005 | 0.004 |
| 106 | 173 | KUK | BAY | 07-Sep | 250 | 1749 | NA | NA | NA | 8.2 | NA | 19050 | NA | NA | 3.7 | NA | NA | NA | NA |
| 118 | 144 | KUK | BAY | 12-Sep | 255 | 1638 | 2000 | < 1 | 8.09 | 8.5 | 23200 | 25200 | 0.8 | 1.3 | 3.7 | 0.013 | 0.087 | 0.005 | 0.005 |

*UF = unfiltered, F = filtered, C = centrifuged
**Kuk = Kukjuktuk

Table 5. Chemistry and water quality data for lakes and channels in the Mackenzie Delta study area.

| Station number | Anal # | B- | LOCATION | Date 1985 | # of day | SN µmol/L | TDN µmol/L | SP µmol/L | TDP µmol/L | DOC µmol/L | TSC µmol/L | SRSi µmol/L | Cl µmol/L | SO4 µmol/L | FSS mg/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | TDFe µmol/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 6 | | BIG LAKE CHANNEL | 18-Jun | 169 | 23.1 | NA | 5.273 | 0.484 | 540 | 651.1 | 52.31 | 113 | 187 | 209 | 199 | 26 | 714 | 274 | 1.97 |
| 16 | 13 | | BIG LAKE CHANNEL | 23-Jun | 174 | 14.6 | NA | 3.190 | 0.452 | 450 | 341.4 | 54.45 | 141 | 224 | 134 | 203 | 23 | 694 | 266 | 1.97 |
| 25 | 21 | | BIG LAKE CHANNEL | 28-Jun | 179 | 5.4 | NA | 2.519 | 0.420 | 500 | 109.1 | 54.09 | 141 | 219 | 101 | 225 | 26 | 726 | 288 | 2.69 |
| 37 | 38 | | BIG LAKE CHANNEL | 03-Jul | 184 | 9.4 | NA | 1.834 | 0.355 | 520 | 224.0 | 58.36 | 141 | 250 | 61 | 247 | 25 | 744 | 307 | 1.97 |
| 47 | 47 | | BIG LAKE CHANNEL | 15-Jul | 196 | 18.3 | NA | 3.978 | 0.387 | 400 | 503.5 | 57.30 | 141 | 260 | 181 | 244 | 23 | 758 | 316 | 1.97 |
| 63 | 70 | | BIG LAKE CHANNEL | 29-Jul | 210 | 8.9 | NA | 1.886 | 0.323 | 390 | 232.3 | 57.30 | 141 | 286 | 78 | 227 | 21 | 758 | 324 | 0.72 |
| 79 | 90 | | BIG LAKE CHANNEL | 13-Aug | 225 | 5.8 | NA | 1.020 | 0.323 | 380 | 127.4 | 53.38 | 197 | 291 | 43 | 257 | 24 | 736 | 288 | < 0.72 |
| 101 | 116 | | BIG LAKE CHANNEL | 29-Aug | 241 | 5.6 | NA | 0.749 | 0.258 | 330 | 82.4 | 48.40 | 197 | 323 | 22 | 338 | 24 | 841 | 353 | 1.43 |
| 114 | 135 | | BIG LAKE CHANNEL | 10-Sep | 253 | 6.4 | NA | 1.253 | 0.291 | 390 | 110.7 | 54.09 | 169 | 302 | 35 | 306 | 24 | 818 | 344 | 1.43 |
| 13 | 9 | | SOUTH LAKE | 18-Jun | 169 | 5.7 | NA | 0.517 | 0.581 | 780 | 49.1 | 50.18 | 141 | 177 | 9 | 225 | 33 | 758 | 285 | 5.37 |
| 19 | 16 | | SOUTH LAKE | 23-Jun | 174 | 8.9 | NA | 0.530 | 0.581 | 780 | 67.4 | 50.53 | 169 | 219 | NA | 234 | 34 | 773 | 290 | 5.37 |
| 28 | 24 | | SOUTH LAKE | 28-Jun | 179 | 3.0 | NA | 0.465 | 0.452 | 800 | 26.6 | 53.02 | 141 | 198 | NA | 236 | 36 | 818 | 304 | 3.94 |
| 40 | 41 | | SOUTH LAKE | 03-Jul | 184 | 7.6 | NA | 0.452 | 0.355 | 820 | 64.1 | 54.09 | 141 | 198 | NA | 241 | 36 | 836 | 310 | 3.40 |
| 50 | 50 | | SOUTH LAKE | 15-Jul | 196 | 18.3 | NA | 0.426 | 0.387 | 730 | 52.5 | 55.87 | 141 | 234 | 5 | 245 | 35 | 881 | 327 | 2.69 |
| 66 | 73 | | SOUTH LAKE | 29-Jul | 210 | 5.6 | NA | 0.297 | 0.323 | 750 | 45.0 | 47.33 | 141 | 260 | 3 | 251 | 35 | 903 | 327 | 0.72 |
| 82 | 93 | | SOUTH LAKE | 13-Aug | 225 | 5.6 | NA | 0.336 | 0.387 | 770 | 44.1 | 35.44 | 183 | 239 | 4 | 252 | 36 | 891 | 305 | 0.72 |
| 103 | 118 | | SOUTH LAKE | 29-Aug | 241 | 5.5 | NA | 0.413 | 0.291 | 620 | 47.5 | 25.69 | 169 | 250 | 7 | 285 | 32 | 921 | 344 | 2.15 |
| 116 | 137 | | SOUTH LAKE | 10-Sep | 253 | 5.2 | NA | 0.633 | 0.291 | 500 | 46.6 | 26.33 | 169 | 271 | 6 | 283 | 32 | 921 | 350 | 1.43 |
| 12 | 8 | | SOUTH LAKE BAY | 18-Jun | 169 | 6.9 | NA | 0.788 | 0.613 | 740 | 58.3 | 53.38 | 141 | 177 | 9 | 230 | 35 | 768 | 282 | 5.91 |
| 18 | 15 | | SOUTH LAKE BAY | 23-Jun | 174 | 8.3 | NA | 0.491 | 0.549 | 790 | 67.4 | 53.02 | 169 | 224 | NA | 233 | 35 | 788 | 290 | 5.37 |
| 27 | 23 | | SOUTH LAKE BAY | 28-Jun | 179 | 3.5 | NA | 0.439 | 0.452 | 830 | 29.1 | 54.09 | 141 | 198 | NA | 240 | 35 | 823 | 304 | 3.40 |
| 39 | 40 | | SOUTH LAKE BAY | 03-Jul | 184 | 10.1 | NA | 0.633 | 0.355 | 820 | 78.3 | 55.16 | 141 | 198 | NA | 234 | 34 | 851 | 307 | 2.69 |
| 49 | 49 | | SOUTH LAKE BAY | 15-Jul | 196 | 6.1 | NA | 0.362 | 0.387 | 750 | 53.3 | 53.38 | 141 | 234 | 3 | 244 | 36 | 908 | 329 | 2.69 |
| 65 | 72 | | SOUTH LAKE BAY | 29-Jul | 210 | 5.6 | NA | 0.284 | 0.323 | 800 | 47.5 | 44.13 | 141 | 260 | 3 | 250 | 35 | 921 | 332 | 0.72 |
| 81 | 92 | | SOUTH LAKE BAY | 13-Aug | 225 | 5.3 | NA | 0.284 | 0.387 | 830 | 45.8 | 27.30 | 183 | 271 | 3 | 257 | 33 | 848 | 313 | < 0.72 |
| 102 | 117 | | SOUTH LAKE BAY | 29-Aug | 241 | 5.0 | NA | 0.271 | 0.323 | 650 | 37.5 | 10.85 | 169 | 281 | 4 | 289 | 30 | 761 | 350 | 2.15 |
| 115 | 136 | | SOUTH LAKE BAY | 10-Sep | 253 | 4.6 | NA | 0.413 | 0.291 | 630 | 36.6 | 9.61 | 169 | 281 | 3 | 285 | 30 | 773 | 350 | 1.43 |
| 11 | 7 | | SKIDOO LAKE | 18-Jun | 169 | 8.0 | NA | 0.530 | 0.549 | 770 | 59.1 | 47.69 | 169 | 198 | 9 | 240 | 33 | 773 | 290 | 3.94 |
| 17 | 14 | | SKIDOO LAKE | 23-Jun | 174 | 7.3 | NA | 0.840 | 0.517 | 690 | 79.9 | 49.11 | 169 | 239 | 16 | 239 | 31 | 773 | 296 | 3.40 |
| 26 | 22 | | SKIDOO LAKE | 28-Jun | 179 | 3.3 | NA | 0.827 | 0.420 | 610 | 33.3 | 50.89 | 141 | 219 | 19 | 235 | 29 | 791 | 302 | 2.69 |
| 38 | 39 | | SKIDOO LAKE | 03-Jul | 184 | 5.4 | NA | 0.607 | 0.355 | 560 | 60.8 | 54.09 | 141 | 229 | 11 | 243 | 28 | 796 | 304 | 1.97 |
| 48 | 48 | | SKIDOO LAKE | 15-Jul | 196 | 8.5 | NA | 1.408 | 0.355 | 470 | 110.7 | 56.23 | 141 | 260 | 45 | 242 | 25 | 811 | 321 | 1.97 |
| 64 | 71 | | SKIDOO LAKE | 29-Jul | 210 | 5.5 | NA | 0.568 | 0.291 | 440 | 60.8 | 54.09 | 141 | 286 | 16 | 235 | 24 | 796 | 324 | 0.72 |
| 80 | 91 | | SKIDOO LAKE | 13-Aug | 225 | 4.8 | NA | 0.387 | 0.323 | 470 | 43.3 | 39.15 | 169 | 297 | 8 | 241 | 27 | 791 | 297 | < 0.72 |
| 100 | 115 | | SKIDOO LAKE | 29-Aug | 241 | 4.7 | NA | 0.413 | 0.291 | 420 | 44.1 | 24.56 | 169 | 291 | 8 | 291 | 28 | 886 | 341 | 1.43 |
| 112 | 133 | | SKIDOO LAKE | 10-Sep | 253 | 7.7 | NA | 1.033 | 0.258 | 420 | 92.4 | 24.73 | 169 | 291 | 26 | 289 | 27 | 886 | 348 | 0.72 |
| 9 | 5 | | BIG LAKE | 18-Jun | 169 | 25.1 | NA | 4.634 | 0.484 | 560 | 666.9 | 52.31 | 113 | 187 | 232 | 206 | 27 | 714 | 271 | 2.69 |
| 15 | 12 | | BIG LAKE | 23-Jun | 174 | 18.9 | NA | 3.978 | 0.484 | 450 | 477.1 | 54.09 | 141 | 224 | 156 | 205 | 23 | 706 | 269 | 2.69 |
| 24 | 20 | | BIG LAKE | 28-Jun | 179 | 4.2 | NA | 2.880 | 0.420 | 470 | 150.7 | 53.02 | 141 | 219 | 111 | 224 | 25 | 731 | 288 | 1.97 |
| 36 | 37 | | BIG LAKE | 03-Jul | 184 | 4.6 | NA | 0.762 | 0.420 | 570 | 61.6 | 55.16 | 141 | 239 | 19 | 231 | 26 | 746 | 299 | 2.69 |
| 46 | 46 | | BIG LAKE | 15-Jul | 196 | 15.5 | NA | 2.609 | 0.420 | 430 | 179.5 | 57.65 | 141 | 286 | 87 | 246 | 23 | 778 | 321 | 1.97 |
| 62 | 69 | | BIG LAKE | 29-Jul | 210 | 5.4 | NA | 0.904 | 0.291 | 410 | 86.6 | 53.02 | 141 | 260 | 30 | 231 | 23 | 761 | 318 | 0.72 |
| 78 | 89 | | BIG LAKE | 13-Aug | 225 | 6.1 | NA | 0.878 | 0.355 | 440 | 103.2 | 49.47 | 197 | 286 | 37 | 254 | 25 | 749 | 291 | < 0.72 |
| 99 | 114 | | BIG LAKE | 29-Aug | 241 | 4.6 | NA | 0.478 | 0.258 | 350 | 60.0 | 43.77 | 197 | 312 | 15 | 319 | 26 | 841 | 357 | 1.43 |
| 113 | 134 | | BIG LAKE | 10-Sep | 253 | 5.5 | NA | 0.982 | 0.291 | 390 | 85.8 | 52.67 | 169 | 302 | 28 | 304 | 24 | 841 | 350 | 1.43 |

Table 5. Cont. (page 2 of 3).

| Station number | Anal # | B- | LOCATION | Date 1985 | # of day | Inuvik TIC µmol/L | Total Alkal µeq/L | Organic acid µeq/L | pH at 25C FWI | pH at 25C In situ | Sp conductance at 25C µS/cm FWI | Sp conductance at 25C µS/cm In situ | Chlorophyll-a µg/L FWI | Chlorophyll-a µg/L Inuvik | In situ temp C | 10 cm absorbance at * 455 nm F & C | 10 cm absorbance at * 543 nm UF | 543 nm F | 543 nm F & C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 6 | | BIG LAKE CHANNEL | 18-Jun | 169 | 1652 | 1950 | 51 | 8.24 | 7.6 | 220 | 213 | 1.2 | 1.7 | 10.5 | 0.108 | 3.950 | 0.090 | 0.043 |
| 16 | 13 | | BIG LAKE CHANNEL | 23-Jun | 174 | 1709 | 1740 | 80 | 8.25 | 7.9 | 213 | 206 | 0.9 | 1.4 | 12.5 | 0.085 | 2.570 | 0.070 | 0.033 |
| 25 | 21 | | BIG LAKE CHANNEL | 28-Jun | 179 | 1540 | 1760 | 66 | 8.27 | 7.8 | 221 | 222 | 1.3 | 2.4 | 14.6 | 0.075 | 2.000 | 0.051 | 0.025 |
| 37 | 38 | | BIG LAKE CHANNEL | 03-Jul | 184 | 1776 | 1760 | 49 | 8.20 | 8.1 | 230 | 236 | 2.3 | 2.7 | 15.5 | 0.068 | 1.080 | 0.040 | 0.023 |
| 47 | 47 | | BIG LAKE CHANNEL | 15-Jul | 196 | 1667 | 1960 | NA | 8.36 | 8.5 | 243 | 237 | 1.2 | 1.8 | 13.5 | 0.038 | 3.460 | 0.030 | 0.000 |
| 63 | 70 | | BIG LAKE CHANNEL | 29-Jul | 210 | 1755 | 1840 | NA | 8.44 | NA | 237 | 246 | 2.3 | 3.2 | 14.0 | 0.042 | 1.650 | 0.048 | 0.015 |
| 79 | 90 | | BIG LAKE CHANNEL | 13-Aug | 225 | 1984 | 1840 | NA | 8.27 | 8.1 | 248 | 251 | 2.3 | 3.5 | 14.7 | 0.040 | 0.630 | 0.029 | 0.015 |
| 101 | 116 | | BIG LAKE CHANNEL | 29-Aug | 241 | 1776 | 1890 | 13 | 8.13 | 8.3 | 269 | 251 | 3.4 | 6.5 | 12.3 | 0.031 | 0.575 | 0.026 | 0.011 |
| 114 | 135 | | BIG LAKE CHANNEL | 10-Sep | 253 | 1765 | 1840 | 23 | 8.18 | 8.8 | 261 | 277 | 1.9 | 2.9 | 10.3 | 0.050 | 0.820 | 0.044 | 0.020 |
| 13 | 9 | | SOUTH LAKE | 18-Jun | 169 | 1628 | 1700 | 83 | 8.14 | 7.3 | 221 | 230 | 2.8 | 3.5 | 10.2 | 0.157 | 0.315 | 0.120 | 0.063 |
| 19 | 16 | | SOUTH LAKE | 23-Jun | 174 | 1871 | 1800 | 64 | 8.20 | 8.2 | 228 | 233 | 5.8 | 7.9 | 16.1 | 0.145 | 0.205 | 0.083 | 0.055 |
| 28 | 24 | | SOUTH LAKE | 28-Jun | 179 | 1668 | 1860 | 58 | 8.30 | 7.9 | 238 | 247 | 3.6 | 5.1 | 16.7 | 0.113 | 0.155 | 0.048 | 0.038 |
| 40 | 41 | | SOUTH LAKE | 03-Jul | 184 | 2177 | 1910 | 62 | 8.31 | 7.6 | 244 | 255 | 4.5 | 5.8 | 17.5 | 0.100 | 0.123 | 0.037 | 0.032 |
| 50 | 50 | | SOUTH LAKE | 15-Jul | 196 | 1844 | 2050 | NA | 8.40 | 8.4 | 257 | 268 | 2.5 | 4.1 | 12.7 | 0.060 | 0.129 | 0.015 | 0.007 |
| 66 | 73 | | SOUTH LAKE | 29-Jul | 210 | 1845 | 2110 | NA | 8.10 | 8.8 | 264 | 255 | 2.1 | 3.5 | 13.6 | 0.060 | 0.088 | 0.020 | 0.015 |
| 82 | 93 | | SOUTH LAKE | 13-Aug | 225 | 2252 | 2180 | NA | 8.35 | 8.6 | 275 | 280 | 2.7 | 3.6 | 13.8 | 0.055 | 0.080 | 0.021 | 0.018 |
| 103 | 118 | | SOUTH LAKE | 29-Aug | 241 | 1937 | 2150 | 9 | 8.13 | 8.8 | 275 | 255 | 2.2 | 3.5 | 11.8 | 0.048 | 0.190 | 0.021 | 0.015 |
| 116 | 137 | | SOUTH LAKE | 10-Sep | 253 | 1931 | 2110 | 42 | 8.27 | 8.9 | 276 | 285 | 1.9 | 3.0 | 8.6 | 0.040 | 0.175 | 0.022 | 0.012 |
| 12 | 8 | | SOUTH LAKE BAY | 18-Jun | 169 | 1672 | 1740 | 83 | 8.03 | 7.5 | 224 | 233 | 3.1 | 4.0 | 10.5 | 0.162 | 0.338 | 0.122 | 0.065 |
| 18 | 15 | | SOUTH LAKE BAY | 23-Jun | 174 | 1818 | 1810 | 76 | 8.25 | 8.2 | 230 | 237 | 6.0 | 8.2 | 16.3 | 0.143 | 0.193 | 0.083 | 0.055 |
| 27 | 23 | | SOUTH LAKE BAY | 28-Jun | 179 | 1672 | 1890 | 62 | 8.25 | 7.9 | 240 | 249 | 3.4 | 5.7 | 16.6 | 0.110 | 0.143 | 0.045 | 0.037 |
| 39 | 40 | | SOUTH LAKE BAY | 03-Jul | 184 | 2104 | 1980 | 72 | 8.28 | 7.8 | 248 | 258 | 4.3 | 5.2 | 17.5 | 0.095 | 0.105 | 0.035 | 0.030 |
| 49 | 49 | | SOUTH LAKE BAY | 15-Jul | 196 | 1906 | 2110 | NA | 8.44 | 8.2 | 264 | 275 | 2.5 | 4.1 | 12.3 | 0.055 | 0.070 | 0.007 | 0.003 |
| 65 | 72 | | SOUTH LAKE BAY | 29-Jul | 210 | 1903 | 2160 | NA | 8.46 | NA | 270 | 289 | 2.1 | 3.1 | 13.9 | 0.055 | 0.075 | 0.020 | 0.015 |
| 81 | 92 | | SOUTH LAKE BAY | 13-Aug | 225 | 1999 | 2050 | NA | 8.39 | 8.9 | 266 | 267 | 3.2 | 4.5 | 13.8 | 0.054 | 0.062 | 0.020 | 0.017 |
| 102 | 117 | | SOUTH LAKE BAY | 29-Aug | 241 | 1519 | 1740 | 25 | 8.15 | 9.3 | 257 | 221 | 1.8 | 2.9 | 11.8 | 0.042 | 0.090 | 0.018 | 0.015 |
| 115 | 136 | | SOUTH LAKE BAY | 10-Sep | 253 | 1593 | 1760 | 48 | 8.20 | 9.3 | 250 | 253 | 1.7 | 2.5 | 8.1 | 0.042 | 0.100 | 0.018 | 0.015 |
| 11 | 7 | | SKIDOO LAKE | 18-Jun | 169 | 1686 | 1750 | 83 | 8.13 | 7.8 | 230 | 237 | 4.0 | 5.3 | 9.7 | 0.135 | 0.285 | 0.080 | 0.052 |
| 17 | 14 | | SKIDOO LAKE | 23-Jun | 174 | 1844 | 1780 | 77 | 8.25 | 8.1 | 233 | 241 | 3.6 | 4.5 | 15.1 | 0.122 | 0.470 | 0.070 | 0.047 |
| 26 | 22 | | SKIDOO LAKE | 28-Jun | 179 | 1562 | 1780 | 62 | 8.26 | 7.9 | 233 | 239 | 3.1 | 5.1 | 15.1 | 0.085 | 0.540 | 0.047 | 0.030 |
| 38 | 39 | | SKIDOO LAKE | 03-Jul | 184 | 1847 | 1790 | 45 | 8.32 | 8.2 | 238 | 247 | 3.5 | 4.3 | 16.7 | 0.083 | 0.309 | 0.039 | 0.027 |
| 48 | 48 | | SKIDOO LAKE | 15-Jul | 196 | 1661 | 1840 | NA | 8.33 | 8.6 | 246 | 248 | 2.2 | 3.5 | 12.6 | 0.037 | 1.150 | 0.018 | 0.000 |
| 64 | 71 | | SKIDOO LAKE | 29-Jul | 210 | 1643 | 1820 | NA | 8.54 | NA | 243 | 258 | 2.7 | 3.9 | 13.6 | 0.042 | 0.453 | 0.028 | 0.013 |
| 80 | 91 | | SKIDOO LAKE | 13-Aug | 225 | 1860 | 1900 | NA | 8.35 | 8.3 | 254 | 257 | 1.7 | 2.3 | 13.1 | 0.038 | 0.166 | 0.015 | 0.012 |
| 100 | 115 | | SKIDOO LAKE | 29-Aug | 241 | 1802 | 1960 | < 1 | 8.12 | 8.7 | 266 | 245 | 1.1 | 1.9 | 11.1 | 0.030 | 0.246 | 0.018 | 0.010 |
| 112 | 133 | | SKIDOO LAKE | 10-Sep | 253 | 1837 | 2010 | 35 | 8.17 | 8.8 | 282 | 269 | 1.9 | 2.9 | 8.0 | 0.030 | 0.620 | 0.020 | 0.010 |
| 9 | 5 | | BIG LAKE | 18-Jun | 169 | 1692 | 2020 | 65 | 8.21 | 7.8 | 225 | 210 | 1.2 | 1.8 | 10.2 | 0.108 | 4.130 | 0.095 | 0.043 |
| 15 | 12 | | BIG LAKE | 23-Jun | 174 | 1758 | 1790 | 71 | 8.25 | 8.0 | 213 | 205 | 1.0 | 1.8 | 12.6 | 0.090 | 2.580 | 0.082 | 0.035 |
| 24 | 20 | | BIG LAKE | 28-Jun | 179 | 1706 | 1780 | 66 | 8.28 | 7.9 | 221 | 221 | 1.3 | 2.4 | 14.6 | 0.075 | 2.230 | 0.055 | 0.025 |
| 36 | 37 | | BIG LAKE | 03-Jul | 184 | 1712 | 1680 | 48 | 8.24 | 8.2 | 227 | 234 | 2.5 | 3.7 | 16.2 | 0.083 | 0.555 | 0.049 | 0.030 |
| 46 | 46 | | BIG LAKE | 15-Jul | 196 | 1640 | 1800 | NA | 8.31 | 8.6 | 241 | 242 | 1.4 | 2.1 | 12.2 | 0.043 | 2.510 | 0.047 | 0.005 |
| 62 | 69 | | BIG LAKE | 29-Jul | 210 | 1838 | 1760 | NA | 8.42 | 8.4 | 235 | 244 | 2.4 | 1.8 | 13.8 | 0.044 | 0.850 | 0.045 | 0.015 |
| 78 | 89 | | BIG LAKE | 13-Aug | 225 | 1918 | 1860 | NA | 8.32 | 8.5 | 248 | 251 | 1.1 | 4.7 | 14.2 | 0.040 | 0.520 | 0.028 | 0.015 |
| 99 | 114 | | BIG LAKE | 29-Aug | 241 | 1756 | 1870 | < 1 | 8.14 | 8.5 | 266 | 247 | 2.6 | 5.9 | 11.7 | 0.028 | 0.410 | 0.023 | 0.010 |
| 113 | 134 | | BIG LAKE | 10-Sep | 253 | 1731 | 1850 | 69 | 8.20 | 8.7 | 263 | 270 | 2.1 | 3.6 | 9.4 | 0.048 | 0.720 | 0.035 | 0.015 |

Table 5. Cont. (page 3 of 3).

| Station number | Anal # | B- LOCATION | Date 1985 | # of day | SN µmol/L | TDN µmol/L | SP µmol/L | TDP µmol/L | DOC µmol/L | TSC µmol/L | SRSi µmol/L | Cl µmol/L | SO4 µmol/L | FSS mg/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | TDFe µmol/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3 | EAST CHANNEL | 15-Jun | 166 | NA | NA | 5.760 | 0.517 | 570 | NA | 50.89 | 113 | 198 | 314 | 208 | 27 | 711 | 274 | 2.69 |
| 14 | 10 | EAST CHANNEL | 18-Jun | 169 | NA | NA | 5.531 | 0.452 | 550 | NA | 54.09 | 113 | 187 | 224 | 201 | 26 | 711 | 271 | 2.69 |
| 20 | 17 | EAST CHANNEL | 23-Jun | 174 | 17.1 | NA | 2.919 | 0.484 | 450 | 424.6 | 54.09 | 155 | 224 | 150 | 203 | 23 | 691 | 269 | 1.97 |
| 29 | 25 | EAST CHANNEL | 28-Jun | 179 | 6.9 | NA | 2.790 | 0.387 | 490 | 124.9 | 54.09 | 141 | 219 | 107 | 230 | 26 | 731 | 290 | 2.69 |
| 41 | 42 | EAST CHANNEL | 03-Jul | 184 | 9.2 | NA | 2.015 | 0.387 | 510 | 227.3 | 58.72 | 141 | 250 | 77 | 250 | 26 | 746 | 310 | 1.97 |
| 51 | 51 | EAST CHANNEL | 15-Jul | 196 | 29.3 | NA | 3.500 | 0.420 | 410 | 517.9 | 57.65 | 141 | 260 | 176 | 235 | 23 | 744 | 316 | 1.97 |
| 67 | 74 | EAST CHANNEL | 29-Jul | 210 | 9.4 | NA | 1.912 | 0.258 | 400 | 249.8 | 57.65 | 141 | 286 | 77 | 224 | 21 | 756 | 321 | 1.25 |
| 83 | 94 | EAST CHANNEL | 13-Aug | 225 | 5.6 | NA | 0.995 | 0.355 | 410 | 123.2 | 53.74 | 197 | 297 | 39 | 259 | 24 | 744 | 296 | 0.72 |
| 104 | 119 | EAST CHANNEL | 29-Aug | 241 | 5.7 | NA | 0.814 | 0.258 | 330 | 84.1 | 48.75 | 197 | 312 | 25 | 321 | 24 | 841 | 353 | 2.15 |
| 105 | 127 | EAST CHANNEL | 04-Sep | 247 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 117 | 138 | EAST CHANNEL | 10-Sep | 253 | 6.5 | NA | 1.279 | 0.291 | 380 | 110.7 | 53.74 | 169 | 302 | 36 | 304 | 24 | 818 | 348 | 1.43 |
| 124 | 152 | EAST CHANNEL | 16-Sep | 259 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station number | Anal # | B- LOCATION | Date 1985 | # of day | Inuvik TIC µmol/L | Total Alkal µeq/L | Organic acid µeq/L | pH at 25C FWI | pH at 25C In situ | Sp conductance at 25C µS/cm FWI | Sp conductance at 25C µS/cm In situ | Chlorophyll-a µg/L FWI | Chlorophyll-a µg/L Inuvik | In situ temp C | 10 cm absorbance at * 455 nm F & C | 10 cm absorbance at * 543 nm UF | 10 cm absorbance at * 543 nm F | 10 cm absorbance at * 543 nm F & C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3 | EAST CHANNEL | 15-Jun | 166 | 2016 | 2120 | 59 | 8.18 | 8.0 | 226 | 209 | 1.2 | 1.8 | 8.9 | 0.140 | 16.000 | 0.110 | 0.057 |
| 14 | 10 | EAST CHANNEL | 18-Jun | 169 | 1803 | 2020 | 75 | 8.24 | 8.0 | 219 | 213 | 1.2 | 1.8 | 10.6 | 0.098 | 4.000 | 0.075 | 0.037 |
| 20 | 17 | EAST CHANNEL | 23-Jun | 174 | 1773 | 1780 | 71 | 8.25 | 8.1 | 213 | 207 | 0.9 | 1.5 | 12.7 | 0.074 | 2.590 | 0.061 | 0.028 |
| 29 | 25 | EAST CHANNEL | 28-Jun | 179 | 1634 | 1780 | 58 | 8.29 | 8.1 | 223 | 221 | 1.9 | 2.6 | 14.7 | 0.078 | 2.100 | 0.060 | 0.028 |
| 41 | 42 | EAST CHANNEL | 03-Jul | 184 | 1806 | 1790 | 49 | 8.28 | 7.6 | 232 | 236 | 2.0 | 2.7 | 15.7 | 0.064 | 0.970 | 0.039 | 0.020 |
| 51 | 51 | EAST CHANNEL | 15-Jul | 196 | 1695 | 1880 | NA | 8.38 | 8.3 | 239 | 238 | 1.0 | 1.8 | 13.7 | 0.035 | 3.600 | 0.043 | 0.013 |
| 67 | 74 | EAST CHANNEL | 29-Jul | 210 | 1747 | 1860 | NA | 8.13 | NA | 237 | 252 | 2.2 | 3.1 | 14.0 | 0.040 | 1.600 | 0.040 | 0.013 |
| 83 | 94 | EAST CHANNEL | 13-Aug | 225 | 1905 | 1830 | NA | 8.44 | 8.2 | 249 | 256 | 2.4 | 3.5 | 14.7 | 0.037 | 0.800 | 0.028 | 0.014 |
| 104 | 119 | EAST CHANNEL | 29-Aug | 241 | 1815 | 1890 | < 1 | 8.24 | 8.1 | 268 | 251 | 3.4 | 6.7 | 12.5 | 0.036 | 0.620 | 0.031 | 0.014 |
| 105 | 127 | EAST CHANNEL | 04-Sep | 247 | 1834 | NA | NA | NA | NA | NA | NA | 2.6 | 5.3 | 12.0 | NA | NA | NA | NA |
| 117 | 138 | EAST CHANNEL | 10-Sep | 253 | 1769 | 1860 | 33 | 8.24 | NA | 261 | 276 | 1.9 | 3.3 | 10.5 | 0.048 | 0.760 | 0.030 | 0.015 |
| 124 | 152 | EAST CHANNEL | 16-Sep | 259 | 1705 | NA | NA | NA | NA | NA | NA | 0.9 | 1.4 | 7.0 | NA | NA | NA | NA |

* UF = unfiltered, F = filtered, C = centrifuged

Table 6. Chemistry and water quality data for miscellaneous lakes in the McKinley Bay, Kukjuktuk Bay and Mackenzie Delta study areas and Travaillant Lake. These lakes were only sampled once. Boot Lake was sampled once in duplicate.

| Station number | Anal # | B- | LOCATION | Date 1985 | # of day | SN µmol/L | TDN µmol/L | SP µmol/L | TDP µmol/L | DOC µmol/L | TSC µmol/L | SRSi µmol/L | Cl µmol/L | $SO_4$ µmol/L | FSS mg/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | TDFe µmol/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NA | 85 | | TRAVAILLANT LAKE | 30-Jul | 211 | 3.3 | NA | 0.181 | 0.258 | 810 | 27.5 | 9.00 | 65 | 76 | NA | 120 | 24 | 314 | 172 | 0.72 |
| NA | 87 | | MARINE LAKE | 30-Jul | 211 | 17.2 | NA | 0.788 | 0.484 | 300 | 151.5 | 1.28 | 101551 | 7284 | NA | 92174 | 2097 | 3892 | 9543 | 1.25 |
| NA | 86 | | SHALLOW LAKE | 30-Jul | 211 | 9.1 | NA | 0.685 | 0.323 | 520 | 73.3 | 1.78 | 353 | 48 | NA | 280 | 36 | 362 | 202 | 0.72 |
| 7 | 1 | | BOOT LAKE | 15-Jun | 166 | 5.9 | NA | 0.672 | 0.904 | 1060 | 50.8 | 39.86 | 85 | 312 | 6 | 189 | 40 | 611 | 266 | 5.91 |
| 7 | 2 | | BOOT LAKE | 15-Jun | 166 | NA | NA | 0.659 | 0.872 | 1110 | NA | 39.86 | 85 | 333 | 6 | 203 | 39 | 614 | 269 | 5.91 |
| 33 | 30 | | KUK LAKE 33 | 01-Jul | 182 | 7.1 | NA | 0.439 | 0.258 | 460 | 70.8 | 2.88 | 282 | < 10 | NA | 245 | 28 | 241 | 136 | 2.69 |

| Station number | Anal # | B- | LOCATION | Date | # of day | Inuvik TIC µmol/L | Total Alkal µeq/L | Organic acid µeq/L | pH at 25C FWI | pH at 25C In situ | Sp conductance at 25C µS/cm FWI | Sp conductance at 25C µS/cm In situ | Chlorophyll-a µg/L FWI | Chlorophyll-a µg/L Inuvik | In situ temp C | 10 cm absorbance at * 455 nm F & C | 10 cm absorbance at * 543 nm UF | 10 cm absorbance at * 543 nm F | 10 cm absorbance at * 543 nm F & C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NA | 85 | | TRAVAILLANT LAKE | 30-Jul | 211 | NA | 850 | NA | 7.95 | NA | 107 | NA | 1.0 | NA | NA | NA | NA | NA | NA |
| NA | 87 | | MARINE LAKE | 30-Jul | 211 | NA | 1470 | NA | 7.97 | NA | 10200 | NA | 9.3 | NA | NA | NA | NA | NA | NA |
| NA | 86 | | SHALLOW LAKE | 30-Jul | 211 | NA | 1020 | NA | 7.89 | NA | 150 | NA | 2.1 | NA | NA | NA | NA | NA | NA |
| 7 | 1 | | BOOT LAKE | 15-Jun | 166 | 1033 | 1040 | 72 | 7.69 | 7.9 | 193 | 184 | 3.6 | 5.5 | 7.5 | 0.209 | 0.248 | 0.110 | 0.078 |
| 7 | 2 | | BOOT LAKE | 15-Jun | 166 | 1061 | 1140 | 62 | 7.68 | 7.9 | 196 | 184 | 3.8 | 5.5 | NA | 0.210 | 0.269 | 0.105 | 0.079 |
| 33 | 30 | | KUK LAKE 33 | 01-Jul | 182 | 699 | 700 | 11 | 7.82 | 7.8 | 105 | 82 | 3.2 | 4.5 | 8.9 | 0.013 | 0.059 | 0.008 | 0.000 |

* UF = unfiltered, F = filtered, C = centrifuged

Table 7. Results calculated from the Kukjuktuk lakes and Kukjuktuk Bay data in Table 4.

| Column | Explanation |
|---|---|
| ABC | Molar ratios of suspended phosphorous, suspended nitrogen and total suspended carbon to suspended phosphorous. |
| D | Molar ratio of total suspended carbon to suspended nitrogen. |
| E | Dissolved alkalinity (DA) calculated as the difference between cationic and anionic equivalents. |
| F | Calculated in situ DIC. The result is obtained from the DA (column E) and in situ temperature and in situ pH. |
| G | Suspended alkalinity (SA) calculated as the difference between the observed (FWI) total alkalinity and the dissolved alkalinity calculated in column E. |
| H | Suspended inorganic carbon (SIC) calculated as the difference between the observed TIC (Inuvik) and the calculated DIC, column F. |
| I | Total inorganic carbon (TIC) calculated as SA/2 + DIC, from columns G and F. |
| J | Difference between the observed (Inuvik) TIC and the TIC calculated in column I. |
| K | Ratio of dissolved alkalinity (column E) to observed (FWI) total alkalinity (SA/TA). |
| L | Difference in observed specific conductances, FWI - in situ. |
| M | Calculated in situ specific conductance at 25C. Ionic concentrations, including $H^+$ and $OH^-$ concentrations, in combination with the temperature dependent equivalent conductances (Table 9) at in situ temperatures are used in this calculation. $CO_3^{2-}$ and $HCO_3^-$ concentrations are obtained from the dissolved alkalinity (column E), the in situ pH and the in situ temperature. |
| N | Calculated FWI specific conductance at 25C. Ionic concentrations, including FWI $H^+$ and $OH^-$ concentrations, in combination with equivalent conductances at 25C (Table 9) are used in this calculation. $CO_3^{2-}$ and $HCO_3^-$ concentrations are obtained from the dissolved alkalinity (column E), and the FWI pH. |
| O | Difference, observed - calculated (column M) in situ specific conductance. |
| P | Difference, observed - calculated (column N) FWI specific conductance. |

| | | Column A | B | C | D |
|---|---|---|---|---|---|
| | | MOLAR RATIOS | | | |
| | | Ratio of | | | |
| | | SP | SN | TSC | |
| Anal # | LOCATION | Date 1985 | to SP | | TSC SN |
| 27 | KUK LAKE 10 | 01-Jul | 1 | 14 | 118 | 8 |
| 54 | KUK LAKE 10 | 18-Jul | 1 | 14 | 135 | 10 |
| 77 | KUK LAKE 10 | 31-Jul | 1 | 19 | 148 | 8 |
| 97 | KUK LAKE 10 | 15-Aug | 1 | 18 | 133 | 8 |
| 109 | KUK LAKE 10 | 27-Aug | 1 | 22 | 148 | 7 |
| 174 | KUK LAKE 10 | 07-Sep | NA | NA | NA | NA |
| 145 | KUK LAKE 10 | 12-Sep | 1 | 21 | 161 | 8 |
| 28 | KUK LAKE 18 | 01-Jul | 1 | 15 | 127 | 9 |
| 55 | KUK LAKE 18 | 18-Jul | 1 | 15 | 111 | 8 |
| 78 | KUK LAKE 18 | 31-Jul | 1 | 17 | 138 | 8 |
| 108 | KUK LAKE 18 | 27-Aug | 1 | 17 | 138 | 8 |
| 175 | KUK LAKE 18 | 07-Sep | NA | NA | NA | NA |
| 146 | KUK LAKE 18 | 12-Sep | 1 | 18 | 139 | 8 |
| 29 | KUK LAKE 14 | 01-Jul | 1 | 14 | 106 | 8 |
| 56 | KUK LAKE 14 | 18-Jul | 1 | 19 | 147 | 8 |
| 79 | KUK LAKE 14 | 31-Jul | 1 | 20 | 150 | 8 |
| 100 | KUK LAKE 14 | 15-Aug | 1 | 18 | 139 | 8 |
| 106 | KUK LAKE 14 | 27-Aug | 1 | 19 | 141 | 7 |
| 177 | KUK LAKE 14 | 07-Sep | NA | NA | NA | NA |
| 148 | KUK LAKE 14 | 12-Sep | 1 | 19 | 150 | 8 |
| 31 | KUK LAKE 28 | 01-Jul | 1 | 17 | 158 | 10 |
| 58 | KUK LAKE 28 | 18-Jul | 1 | 18 | 163 | 9 |
| 81 | KUK LAKE 28 | 31-Jul | 1 | 22 | 193 | 9 |
| 101 | KUK LAKE 28 | 15-Aug | 1 | 20 | 165 | 8 |
| 105 | KUK LAKE 28 | 27-Aug | 1 | 20 | 159 | 8 |
| 178 | KUK LAKE 28 | 07-Sep | NA | NA | NA | NA |
| 149 | KUK LAKE 28 | 12-Sep | 1 | 22 | 193 | 9 |
| 32 | KUK LAKE 7 | 01-Jul | 1 | 16 | 142 | 9 |
| 57 | KUK LAKE 7 | 18-Jul | 1 | 19 | 159 | 8 |
| 80 | KUK LAKE 7 | 31-Jul | 1 | 21 | 156 | 8 |
| 99 | KUK LAKE 7 | 15-Aug | 1 | 19 | 157 | 8 |
| 107 | KUK LAKE 7 | 27-Aug | 1 | 22 | 163 | 8 |
| 176 | KUK LAKE 7 | 07-Sep | NA | NA | NA | NA |
| 147 | KUK LAKE 7 | 12-Sep | 1 | 18 | 147 | 8 |
| 53 | KUK BAY | 18-Jul | 1 | 14 | 119 | 9 |
| 76 | KUK BAY | 31-Jul | 1 | 13 | 111 | 9 |
| 96 | KUK BAY | 15-Aug | 1 | 15 | 113 | 8 |
| 110 | KUK BAY | 27-Aug | 1 | 15 | 111 | 7 |
| 173 | KUK BAY | 07-Sep | NA | NA | NA | NA |
| 144 | KUK BAY | 12-Sep | 1 | 12 | 103 | 9 |

Table 7. Cont. (page 2 of 2).

| Anal # | LOCATION | Date 1985 | Column E: ALKALINITY and INORGANIC CARBON — DA Calculated from ion equivalents µeq/L | Column F: ALKALINITY and INORGANIC CARBON — DIC from ion equivalents µmol/L | Column G: SA= TA-DA µeq/L | Column H: SIC= TIC-DIC µmol/L | Column I: TIC = SA/2 + DIC — Difference (obs-calc) µmol/L | Column J: TIC = SA/2 + DIC — Difference (obs-calc) µmol/L | Column K: DA/TA | Column L: SPECIFIC CONDUCTANCE — Sp cond Difference FWI-in situ µS/cm | Column M: SPECIFIC CONDUCTANCE — Calculated Spec conductance using $HCO_3$ & $CO_3$ calc from in situ µS/cm | Column N: SPECIFIC CONDUCTANCE — Calculated Spec conductance using $HCO_3$ & $CO_3$ DIC FWI µS/cm | Column O: Difference from observed sp cond in situ FWI obs-calc µS/cm | Column P: Difference from observed sp cond FWI obs-calc µS/cm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | KUK LAKE 10 | 01-Jul | 726 | 756 | -36 | -51 | 738 | -32 | 1.052 | 13 | 129 | 134 | -17 | -9 |
| 54 | KUK LAKE 10 | 18-Jul | 848 | 855 | -98 | -156 | 805 | -106 | 1.131 | 31 | 154 | 161 | -29 | -5 |
| 77 | KUK LAKE 10 | 31-Jul | 829 | 834 | -49 | -129 | 809 | -105 | 1.063 | 19 | 167 | 173 | -34 | -21 |
| 97 | KUK LAKE 10 | 15-Aug | 735 | 739 | 65 | 5 | 771 | -28 | 0.918 | 23 | 164 | 170 | -30 | -13 |
| 109 | KUK LAKE 10 | 27-Aug | 817 | 794 | 13 | -11 | 800 | -17 | 0.985 | 15 | 168 | 175 | -30 | -22 |
| 174 | KUK LAKE 10 | 07-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 145 | KUK LAKE 10 | 12-Sep | 924 | 938 | -74 | -94 | 901 | -57 | 1.087 | 24 | 181 | 189 | -35 | -19 |
| 28 | KUK LAKE 18 | 01-Jul | 1201 | 1248 | -61 | -90 | 1218 | -59 | 1.054 | 22 | 160 | 169 | -28 | -15 |
| 55 | KUK LAKE 18 | 18-Jul | 1306 | 1303 | -46 | -118 | 1280 | -95 | 1.036 | 9 | 180 | 189 | -20 | -20 |
| 78 | KUK LAKE 18 | 31-Jul | 1323 | 1312 | -33 | -41 | 1295 | -25 | 1.025 | 13 | 183 | 191 | -24 | -19 |
| 98 | KUK LAKE 18 | 15-Aug | 1179 | 1169 | 131 | 60 | 1234 | -5 | 0.900 | 21 | 177 | 186 | -23 | -11 |
| 108 | KUK LAKE 18 | 27-Aug | 1307 | 1237 | 13 | -17 | 1243 | -23 | 0.990 | 12 | 183 | 193 | -28 | -26 |
| 175 | KUK LAKE 18 | 07-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 146 | KUK LAKE 18 | 12-Sep | 1328 | 1314 | -58 | -119 | 1285 | -90 | 1.046 | 19 | 182 | 192 | -25 | -16 |
| 29 | KUK LAKE 14 | 01-Jul | 965 | 982 | -35 | -83 | 964 | -65 | 1.038 | 18 | 128 | 133 | -20 | -7 |
| 56 | KUK LAKE 14 | 18-Jul | 1048 | 1034 | 12 | -106 | 1040 | -112 | 0.989 | 20 | 145 | 152 | -22 | -9 |
| 79 | KUK LAKE 14 | 31-Jul | 1071 | 1061 | -51 | -41 | 1036 | -15 | 1.050 | 17 | 148 | 155 | -26 | -16 |
| 100 | KUK LAKE 14 | 15-Aug | 986 | 965 | 84 | -4 | 1007 | -46 | 0.921 | 22 | 150 | 157 | -28 | -13 |
| 106 | KUK LAKE 14 | 27-Aug | 1055 | 1057 | -5 | -57 | 1055 | -55 | 1.005 | 19 | 149 | 157 | -27 | -16 |
| 177 | KUK LAKE 14 | 07-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 148 | KUK LAKE 14 | 12-Sep | 1061 | 1065 | 9 | -69 | 1069 | -73 | 0.991 | 22 | 149 | 157 | -25 | -11 |
| 131 | KUK LAKE 28 | 01-Jul | 1678 | 1711 | -48 | -106 | 1687 | -83 | 1.029 | 6 | 211 | 223 | -14 | -20 |
| 58 | KUK LAKE 28 | 18-Jul | 1625 | 1605 | -35 | -110 | 1588 | -93 | 1.022 | 1 | 206 | 217 | -11 | -21 |
| 81 | KUK LAKE 28 | 31-Jul | 1615 | 1603 | -25 | -76 | 1590 | -63 | 1.016 | 8 | 206 | 216 | -18 | -20 |
| 101 | KUK LAKE 28 | 15-Aug | 1434 | 1437 | 166 | 144 | 1519 | 61 | 0.896 | 17 | 199 | 208 | -19 | -11 |
| 105 | KUK LAKE 28 | 27-Aug | 1591 | 1551 | -1 | -87 | 1551 | -87 | 1.000 | 6 | 208 | 219 | -27 | -32 |
| 178 | KUK LAKE 28 | 07-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 149 | KUK LAKE 28 | 12-Sep | 1611 | 1602 | -51 | -149 | 1576 | -123 | 1.033 | 14 | 206 | 217 | -23 | -20 |
| 32 | KUK LAKE 7 | 01-Jul | 1088 | 1131 | -48 | -55 | 1107 | -31 | 1.046 | 25 | 146 | 154 | -26 | -9 |
| 57 | KUK LAKE 7 | 18-Jul | 1063 | 1054 | -53 | -35 | 1028 | -9 | 1.052 | 6 | 151 | 159 | -21 | -23 |
| 80 | KUK LAKE 7 | 31-Jul | 1064 | 1065 | -24 | -31 | 1053 | -19 | 1.023 | 16 | 152 | 159 | -24 | -15 |
| 99 | KUK LAKE 7 | 15-Aug | 1000 | 996 | 60 | 5 | 1026 | -25 | 0.943 | 21 | 168 | 175 | -44 | -30 |
| 107 | KUK LAKE 7 | 27-Aug | 1069 | 1032 | 11 | -32 | 1037 | -37 | 0.990 | 17 | 151 | 159 | -26 | -17 |
| 176 | KUK LAKE 7 | 07-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 147 | KUK LAKE 7 | 12-Sep | 1106 | 1110 | -36 | -91 | 1092 | -73 | 1.034 | 21 | 153 | 161 | -27 | -14 |
| 53 | KUK BAY | 18-Jul | -2013 | -2027 | 3233 | 3221 | -410 | 1604 | -1.650 | -1050 | 11650 | 11912 | -1550 | -2862 |
| 76 | KUK BAY | 31-Jul | -9846 | -9937 | 11356 | 11580 | -4259 | 5903 | -6.520 | -800 | 15449 | 15746 | -4549 | -5646 |
| 96 | KUK BAY | 15-Aug | -12776 | -12832 | 14476 | 14628 | -5594 | 7390 | -7.515 | -600 | 14490 | 14751 | -2690 | -3551 |
| 110 | KUK BAY | 27-Aug | -7897 | -7906 | 9677 | 9559 | -3068 | 4721 | -4.436 | -340 | 15543 | 15867 | -2703 | -3367 |
| 173 | KUK BAY | 07-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 144 | KUK BAY | 12-Sep | -21254 | -21307 | 23254 | 22944 | -9680 | 11317 | -10.627 | -2000 | 30858 | 31512 | -5658 | -8312 |

Table 8. Results calculated from the Mackenzie Delta lakes and channels data in Table 5.

| Column | Explanation |
|---|---|
| ABC | Molar ratios of suspended phosphorous, suspended nitrogen and total suspended carbon to suspended phosphorous. |
| D | Molar ratio of total suspended carbon to suspended nitrogen. |
| E | Dissolved alkalinity (DA) calculated as the difference between cationic and anionic equivalents. |
| F | Calculated in situ DIC. The result is obtained from the DA (column E) and in situ temperature and in situ pH. |
| G | Suspended alkalinity (SA) calculated as the difference between the observed (FWI) total alkalinity and the dissolved alkalinity calculated in column E. |
| H | Suspended inorganic carbon (SIC) calculated as the difference between the observed TIC (Inuvik) and the calculated DIC, column F. |
| I | Total inorganic carbon (TIC) calculated as SA/2 + DIC, from columns G and F. |
| J | Difference between the observed (Inuvik) TIC and the TIC calculated in column I. |
| K | Ratio of dissolved alkalinity (column E) to observed (FWI) total alkalinity (SA/TA). |
| L | Difference in observed specific conductances, FWI - in situ. |
| M | Calculated in situ specific conductance at 25C. Ionic concentrations, including $H^+$ and $OH^-$ concentrations, in combination with the temperature dependent equivalent conductances (Table 9) at in situ temperatures are used in this calculation. $CO_3^{2-}$ and $HCO_3^-$ concentrations are obtained from the dissolved alkalinity (column |
| N | Calculated FWI specific conductance at 25C. Ionic concentrations, including FWI $H^+$ and $OH^-$ concentrations, in combination with equivalent conductances at 25C (Table 9) are used in this calculation. $CO_3^{2-}$ and $HCO_3^-$ concentrations are obtained from the dissolved alkalinity (column E), and the FWI pH. |
| O | Difference, observed - calculated (column M) in situ specific conductance. |
| P | Difference, observed - calculated (column N) FWI specific conductance. |

| Anal # | LOCATION | Date 1985 | Column A | B | C | D |
|---|---|---|---|---|---|---|
| | | | MOLAR RATIOS | | | |
| | | | Ratio of | | | |
| | | | SP | SN | TSC | TSC |
| | | | to SP | | | SN |
| 6 | BIG LAKE CHANNEL | 18-Jun | 1 | 4 | 123 | 28 |
| 13 | BIG LAKE CHANNEL | 23-Jun | 1 | 5 | 107 | 23 |
| 21 | BIG LAKE CHANNEL | 28-Jun | 1 | 2 | 43 | 20 |
| 38 | BIG LAKE CHANNEL | 03-Jul | 1 | 5 | 122 | 24 |
| 47 | BIG LAKE CHANNEL | 15-Jul | 1 | 5 | 127 | 28 |
| 70 | BIG LAKE CHANNEL | 29-Jul | 1 | 5 | 123 | 26 |
| 90 | BIG LAKE CHANNEL | 13-Aug | 1 | 6 | 125 | 22 |
| 116 | BIG LAKE CHANNEL | 29-Aug | 1 | 7 | 110 | 15 |
| 135 | BIG LAKE CHANNEL | 10-Sep | 1 | 5 | 88 | 17 |
| 9 | SOUTH LAKE | 18-Jun | 1 | 11 | 95 | 9 |
| 16 | SOUTH LAKE | 23-Jun | 1 | 17 | 127 | 8 |
| 24 | SOUTH LAKE | 28-Jun | 1 | 6 | 57 | 9 |
| 41 | SOUTH LAKE | 03-Jul | 1 | 17 | 142 | 8 |
| 50 | SOUTH LAKE | 15-Jul | 1 | 43 | 123 | 3 |
| 73 | SOUTH LAKE | 29-Jul | 1 | 19 | 151 | 8 |
| 93 | SOUTH LAKE | 13-Aug | 1 | 17 | 131 | 8 |
| 118 | SOUTH LAKE | 29-Aug | 1 | 13 | 115 | 9 |
| 137 | SOUTH LAKE | 10-Sep | 1 | 8 | 74 | 9 |
| 23 | SOUTH LAKE BAY | 28-Jun | 1 | 8 | 66 | 8 |
| 40 | SOUTH LAKE BAY | 03-Jul | 1 | 16 | 124 | 8 |
| 49 | SOUTH LAKE BAY | 15-Jul | 1 | 17 | 147 | 9 |
| 72 | SOUTH LAKE BAY | 29-Jul | 1 | 20 | 167 | 9 |
| 92 | SOUTH LAKE BAY | 13-Aug | 1 | 19 | 161 | 9 |
| 117 | SOUTH LAKE BAY | 29-Aug | 1 | 18 | 138 | 7 |
| 136 | SOUTH LAKE BAY | 10-Sep | 1 | 11 | 89 | 8 |
| 7 | SKIDOO LAKE | 18-Jun | 1 | 15 | 112 | 7 |
| 14 | SKIDOO LAKE | 23-Jun | 1 | 9 | 95 | 11 |
| 22 | SKIDOO LAKE | 28-Jun | 1 | 4 | 40 | 10 |
| 39 | SKIDOO LAKE | 03-Jul | 1 | 9 | 100 | 11 |
| 48 | SKIDOO LAKE | 15-Jul | 1 | 6 | 79 | 13 |
| 71 | SKIDOO LAKE | 29-Jul | 1 | 10 | 107 | 11 |
| 91 | SKIDOO LAKE | 13-Aug | 1 | 12 | 112 | 9 |
| 115 | SKIDOO LAKE | 29-Aug | 1 | 11 | 107 | 9 |
| 133 | SKIDOO LAKE | 10-Sep | 1 | 7 | 89 | 12 |
| 5 | BIG LAKE | 18-Jun | 1 | 5 | 144 | 27 |
| 12 | BIG LAKE | 23-Jun | 1 | 5 | 120 | 25 |
| 20 | BIG LAKE | 28-Jun | 1 | 1 | 52 | 36 |
| 37 | BIG LAKE | 03-Jul | 1 | 6 | 81 | 13 |
| 46 | BIG LAKE | 15-Jul | 1 | 6 | 69 | 12 |
| 69 | BIG LAKE | 29-Jul | 1 | 6 | 96 | 15 |
| 89 | BIG LAKE | 13-Aug | 1 | 7 | 118 | 17 |
| 114 | BIG LAKE | 29-Aug | 1 | 10 | 125 | 13 |

Table 8. Cont. (page 2 of 3).

| Anal # | LOCATION | Date 1985 | Column E: DA Calculated from ion equivalents µeq/L | Column F: DIC from equivalents µmol/L | Column G: SA= TA-DA µeq/L | Column H: SIC= TIC-DIC µmol/L | Column I: TIC = SA/2 + DIC µmol/L | Column J: Difference (obs-calc) µmol/L | Column K: DA/TA | Column L: Sp cond Difference FWI-in situ µS/cm | Column M: Calculated Spec conductance using $HCO_3$ & $CO_3$ calc from DIC in situ µS/cm | Column N: Calculated Spec conductance using $HCO_3$ & $CO_3$ calc from DIC FWI µS/cm | Column O: Difference from observed sp cond in situ obs-calc µS/cm | Column P: Difference from observed sp cond FWI obs-calc µS/cm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ALKALINITY and INORGANIC CARBON | | | | | | | SPECIFIC CONDUCTANCE | | | | |
| 6 | BIG LAKE CHANNEL | 18-Jun | 1712 | 1834 | 238 | -182 | 1953 | -301 | 0.878 | 7 | 230 | 242 | -17 | -22 |
| 13 | BIG LAKE CHANNEL | 23-Jun | 1556 | 1605 | 184 | 104 | 1697 | 12 | 0.894 | 7 | 229 | 239 | -23 | -26 |
| 21 | BIG LAKE CHANNEL | 28-Jun | 1701 | 1767 | 59 | -228 | 1797 | -257 | 0.966 | -1 | 242 | 253 | -20 | -32 |
| 38 | BIG LAKE CHANNEL | 03-Jul | 1733 | 1759 | 27 | 17 | 1772 | 3 | 0.984 | -6 | 254 | 264 | -18 | -34 |
| 47 | BIG LAKE CHANNEL | 15-Jul | 1754 | 1746 | 206 | -78 | 1849 | -182 | 0.895 | 6 | 258 | 269 | -21 | -26 |
| 70 | BIG LAKE CHANNEL | 29-Jul | 1700 | NA | 140 | NA | NA | NA | 0.924 | -9 | NA | 271 | NA | -34 |
| 90 | BIG LAKE CHANNEL | 13-Aug | 1549 | 1573 | 291 | 411 | 1718 | 266 | 0.842 | -3 | 254 | 264 | -3 | -16 |
| 116 | BIG LAKE CHANNEL | 29-Aug | 1908 | 1919 | -18 | -144 | 1910 | -135 | 1.010 | 18 | 296 | 309 | -45 | -40 |
| 135 | BIG LAKE CHANNEL | 10-Sep | 1882 | 1847 | -42 | -82 | 1826 | -61 | 1.023 | -16 | 283 | 297 | -6 | -36 |
| 9 | SOUTH LAKE | 18-Jun | 1851 | 2119 | -151 | -490 | 2043 | -415 | 1.089 | -9 | 245 | 256 | -15 | -35 |
| 16 | SOUTH LAKE | 23-Jun | 1789 | 1806 | 11 | 65 | 1811 | 60 | 0.994 | -5 | 255 | 265 | -22 | -37 |
| 24 | SOUTH LAKE | 28-Jun | 1981 | 2037 | -121 | -370 | 1977 | -309 | 1.065 | -9 | 265 | 276 | -18 | -38 |
| 41 | SOUTH LAKE | 03-Jul | 2032 | 2156 | -122 | 21 | 2095 | 82 | 1.064 | -11 | 270 | 281 | -15 | -37 |
| 50 | SOUTH LAKE | 15-Jul | 2085 | 2087 | -35 | -243 | 2070 | -226 | 1.017 | -11 | 283 | 297 | -15 | -40 |
| 73 | SOUTH LAKE | 29-Jul | 2084 | 2042 | 26 | -197 | 2055 | -209 | 0.988 | 9 | 290 | 303 | -35 | -39 |
| 93 | SOUTH LAKE | 13-Aug | 2018 | 1999 | 162 | 253 | 2080 | 172 | 0.926 | -5 | 284 | 297 | -4 | -22 |
| 118 | SOUTH LAKE | 29-Aug | 2179 | 2137 | -29 | -201 | 2123 | -186 | 1.013 | 20 | 300 | 314 | -45 | -39 |
| 137 | SOUTH LAKE | 10-Sep | 2147 | 2096 | -37 | -165 | 2078 | -147 | 1.017 | -9 | 300 | 316 | -15 | -40 |
| 8 | SOUTH LAKE BAY | 18-Jun | 1871 | 2039 | -131 | -367 | 1974 | -302 | 1.075 | -9 | 247 | 258 | -14 | -34 |
| 15 | SOUTH LAKE BAY | 23-Jun | 1809 | 1825 | 1 | -7 | 1826 | -8 | 0.999 | -7 | 259 | 269 | -22 | -39 |
| 23 | SOUTH LAKE BAY | 28-Jun | 1994 | 2051 | -104 | -379 | 1999 | -327 | 1.055 | -9 | 266 | 277 | -17 | -37 |
| 40 | SOUTH LAKE BAY | 03-Jul | 2048 | 2123 | -68 | -20 | 2090 | 14 | 1.034 | -10 | 272 | 283 | -14 | -35 |
| 49 | SOUTH LAKE BAY | 15-Jul | 2146 | 2170 | -36 | -264 | 2152 | -246 | 1.017 | -11 | 289 | 303 | -14 | -39 |
| 72 | SOUTH LAKE BAY | 29-Jul | 2129 | NA | 31 | NA | NA | NA | 0.986 | -19 | NA | 309 | NA | -39 |
| 92 | SOUTH LAKE BAY | 13-Aug | 1889 | 1836 | 161 | 163 | 1917 | 82 | 0.921 | -1 | 280 | 292 | -13 | -26 |
| 117 | SOUTH LAKE BAY | 29-Aug | 1811 | 1686 | -71 | -167 | 1651 | -131 | 1.041 | 36 | 271 | 284 | -50 | -27 |
| 136 | SOUTH LAKE BAY | 10-Sep | 1832 | 1716 | -72 | -123 | 1680 | -87 | 1.041 | -3 | 271 | 286 | -18 | -36 |
| 7 | SKIDOO LAKE | 18-Jun | 1836 | 1917 | -86 | -232 | 1874 | -188 | 1.049 | -7 | 252 | 264 | -15 | -34 |
| 14 | SKIDOO LAKE | 23-Jun | 1761 | 1788 | 19 | 56 | 1798 | 47 | 0.989 | -8 | 258 | 268 | -17 | -35 |
| 22 | SKIDOO LAKE | 28-Jun | 1871 | 1926 | -91 | -364 | 1881 | -318 | 1.051 | -6 | 259 | 270 | -20 | -37 |
| 39 | SKIDOO LAKE | 03-Jul | 1872 | 1889 | -82 | -42 | 1848 | -1 | 1.046 | -9 | 262 | 273 | -15 | -35 |
| 48 | SKIDOO LAKE | 15-Jul | 1869 | 1852 | -29 | -192 | 1838 | -177 | 1.016 | -2 | 269 | 281 | -21 | -35 |
| 71 | SKIDOO LAKE | 29-Jul | 1785 | NA | 35 | NA | NA | NA | 0.981 | -15 | NA | 281 | NA | -38 |
| 91 | SKIDOO LAKE | 13-Aug | 1682 | 1691 | 218 | 169 | 1800 | 60 | 0.885 | -3 | 265 | 276 | -8 | -22 |
| 115 | SKIDOO LAKE | 29-Aug | 2021 | 1995 | -61 | -193 | 1964 | -162 | 1.031 | 21 | 295 | 309 | -50 | -43 |
| 133 | SKIDOO LAKE | 10-Sep | 2030 | 1996 | -20 | -160 | 1986 | -149 | 1.010 | 13 | 294 | 310 | -25 | -28 |
| 5 | BIG LAKE | 18-Jun | 1715 | 1789 | 305 | -97 | 1942 | -250 | 0.849 | 15 | 230 | 242 | -20 | -17 |
| 12 | BIG LAKE | 23-Jun | 1589 | 1626 | 201 | 132 | 1727 | 31 | 0.888 | 8 | 232 | 243 | -27 | -30 |
| 20 | BIG LAKE | 28-Jun | 1709 | 1760 | 71 | -55 | 1796 | -90 | 0.960 | 0 | 243 | 253 | -22 | -32 |
| 37 | BIG LAKE | 03-Jul | 1727 | 1743 | -47 | -31 | 1719 | -8 | 1.028 | -7 | 251 | 261 | -17 | -34 |
| 46 | BIG LAKE | 15-Jul | 1754 | 1739 | 46 | -99 | 1762 | -122 | 0.975 | -1 | 264 | 276 | -22 | -35 |
| 69 | BIG LAKE | 29-Jul | 1751 | 1751 | 9 | 87 | 1756 | 82 | 0.995 | -9 | 258 | 269 | -14 | -34 |
| 89 | BIG LAKE | 13-Aug | 1587 | 1580 | 273 | 338 | 1716 | 202 | 0.853 | -3 | 256 | 267 | -5 | -19 |
| 114 | BIG LAKE | 29-Aug | 1918 | 1912 | -48 | -156 | 1888 | -132 | 1.026 | 19 | 294 | 307 | -47 | -41 |
| 134 | BIG LAKE | 10-Sep | 1938 | 1914 | -88 | -182 | 1870 | -139 | 1.047 | -7 | 289 | 303 | -19 | -40 |

Table 8. Cont. (page 3 of 3).

| Anal # | LOCATION | Date 1985 | Column A | B | C | D |
|---|---|---|---|---|---|---|
| | | | MOLAR RATIOS | | | |
| | | | Ratio of SP to SP | SN to SP | TSC to SP | TSC SN |
| 3 | EAST CHANNEL | 15-Jun | 1 | NA | NA | NA |
| 10 | EAST CHANNEL | 18-Jun | 1 | NA | NA | NA |
| 17 | EAST CHANNEL | 23-Jun | 1 | 6 | 145 | 25 |
| 25 | EAST CHANNEL | 28-Jun | 1 | 2 | 45 | 18 |
| 42 | EAST CHANNEL | 03-Jul | 1 | 5 | 113 | 25 |
| 51 | EAST CHANNEL | 15-Jul | 1 | 8 | 148 | 18 |
| 74 | EAST CHANNEL | 29-Jul | 1 | 5 | 131 | 26 |
| 94 | EAST CHANNEL | 13-Aug | 1 | 6 | 124 | 22 |
| 119 | EAST CHANNEL | 29-Aug | 1 | 7 | 103 | 15 |
| 127 | EAST CHANNEL | 04-Sep | NA | NA | NA | NA |
| 138 | EAST CHANNEL | 10-Sep | 1 | 5 | 87 | 17 |
| 152 | EAST CHANNEL | 16-Sep | NA | NA | NA | NA |

| Anal # | LOCATION | Date 1985 | Column E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ALKALINITY and INORGANIC CARBON | | | | | | | SPECIFIC CONDUCTANCE | | | | |
| | | | DA Calculated from ion equivalents eq/L | DIC from mol/L | SA= TA-DA eq/L | SIC= TIC-DIC mol/L | TIC = SA/2 + DIC Difference (obs-calc) mol/L | mol/L | DA/TA | Sp cond Difference FWI-in situ S/cm | Calculated Spec conductance using $HCO_3$ & $CO_3$ calc from DIC in situ S/cm | FWI S/cm | Difference from observed sp cond in situ obs-calc S/cm | FWI S/cm |
| 3 | EAST CHANNEL | 15-Jun | 1696 | 1740 | 424 | 276 | 1952 | 64 | 0.800 | 17 | 231 | 243 | -22 | -17 |
| 10 | EAST CHANNEL | 18-Jun | 1703 | 1746 | 317 | 58 | 1904 | -101 | 0.843 | 6 | 230 | 241 | -17 | -22 |
| 17 | EAST CHANNEL | 23-Jun | 1543 | 1569 | 237 | 204 | 1687 | 86 | 0.867 | 6 | 230 | 240 | -23 | -27 |
| 25 | EAST CHANNEL | 28-Jun | 1720 | 1747 | 60 | -113 | 1777 | -143 | 0.967 | 2 | 244 | 255 | -23 | -32 |
| 42 | EAST CHANNEL | 03-Jul | 1747 | 1857 | 43 | -51 | 1879 | -73 | 0.976 | -4 | 255 | 266 | -19 | -34 |
| 51 | EAST CHANNEL | 15-Jul | 1714 | 1723 | 166 | -28 | 1806 | -111 | 0.912 | 1 | 254 | 265 | -16 | -26 |
| 74 | EAST CHANNEL | 29-Jul | 1685 | NA | 175 | NA | NA | NA | 0.906 | -15 | NA | 269 | NA | -32 |
| 94 | EAST CHANNEL | 13-Aug | 1571 | 1586 | 259 | 319 | 1716 | 189 | 0.858 | -7 | 258 | 268 | -2 | -19 |
| 119 | EAST CHANNEL | 29-Aug | 1911 | 1943 | -21 | -129 | 1933 | -118 | 1.011 | 17 | 294 | 306 | -43 | -38 |
| 127 | EAST CHANNEL | 04-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 138 | EAST CHANNEL | 10-Sep | 1887 | NA | -27 | NA | NA | NA | 1.015 | -15 | NA | 297 | NA | -36 |
| 152 | EAST CHANNEL | 16-Sep | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

Table 9. Physical constants used to calculate the results in Tables 7 and 8.

1 Formula used to convert specific conductance at temperature t to specific conductance at at 25C using 0.001N KCl. Calculated from data in source b.

Specific conductance at 25C = (Sp cond at temp t)*146.9/(80.06+2.6532*t)

2 Ionic limiting equivalent conductances at 25C and as a function of temperature

| cations | @ 25C | Source | equiv cond as F(t) slope | intercept | From data in source |
|---|---|---|---|---|---|
| $Na^+$ | 50.11 | a | 0.9110 | 26.1702 | c |
| $K^+$ | 73.52 | a | 1.2871 | 40.4976 | c |
| $Ca^{++}$ | 59.50 | a | 1.0715 | 31.1467 | c |
| $Mg^{++}$ | 53.06 | a | 0.8889 | 28.900 | c |
| $H^+$ | 349.8 | a | 5.0134 | 225.0479 | c |

| anions | @ 25C | Source | equiv cond as F(t) slope | intercept | From data in source |
|---|---|---|---|---|---|
| $Cl^-$ | 76.35 | a | 1.3871 | 40.7977 | c |
| $SO_4^=$ | 80.0 | a | 1.5222 | 41 | c |
| $HCO_3^-$ | 44.5 | a | - | - | - |
| $CO_3^=$ | 69.3 | d | 1.3611 | 36 | d |
| $OH^-$ | 197.8 | a | 3.9742 | 105.18 | c |
| Equivalent conductance of 0.001N solution as a function of temperature. | | | | | |
| $HCO_3^-$ | | | 0.84137 | 21.3629 | e |

3 Physical constants of the carbonate system, including the solubility product of $CaCO_3$, and the ion product of water at 0C, 25C and as a function of temperature.

| Variable | At temperature 0C | 25C | Source | As a function of absolute temperature T | Source |
|---|---|---|---|---|---|
| pKh | 1.11 | 1.47 | f | -pKh = -1167.1763/T + 5.3868 | from data in f |
| pK1 | 6.579 | 6.352 | f | -pK1 = -3404.71/T + 14.8435 - 0.032786*T | a |
| pK2 | 10.625 | 10.329 | f | -pK2 = -2902.39/T + 6.4980 - 0.02379*T | a |
| pKw | 14.93 | 14.00 | f | -pKw = -4470.99/T + 6.0875 - 0.01706*T | a |
| pKsp ($CaCO_3$) | - | 8.34 | f | pKsp $CaCO_3$ = -1043.864/T +11.843 | from data in f |

4 Sources

a Harned and Owen (1958)
b Shedlovsky and MacInnes (1935)
c Robinson and Stokes (1970)
d Dobos (1975)
e from $KHCO_3$ in reference b and K in reference c
f Stumm and Morgan (1970)

Table 10. Maximum, minimum, mean, sample standard deviation and the sample size (n) of the Kukjuktuk lakes and Kukjuktuk Bay chemistry and water quality data of Table 4.

| LOCATION** | | SN µmol/L | TDN µmol/L | SP µmol/L | TDP µmol/L | DOC µmol/L | TSC µmol/L | SRSi µmol/L | Cl µmol/L | $SO_4$ µmol/L | FSS mg/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | TDFe µmol/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KUK LAKE 10 | Maximum | 15.1 | NA | 1.085 | 0.484 | 550 | 146.5 | 1.92 | 536 | 94 | 6 | 470 | 58 | 342 | 218 | 1.25 |
| | Minimum | 8.6 | NA | 0.465 | 0.355 | 410 | 69.9 | 0.57 | 395 | 31 | 3 | 315 | 49 | 254 | 155 | 0.72 |
| | Mean | 11.6 | NA | 0.669 | 0.398 | 500 | 93.4 | 1.42 | 482 | 79 | 4 | 390 | 55 | 304 | 201 | 0.90 |
| | Standard deviation | 2.44 | NA | 0.2154 | 0.0441 | 52.2 | 28.46 | 0.517 | 58.5 | 25.0 | 1.1 | 51.5 | 3.3 | 29.9 | 24.1 | 0.277 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 18 | Maximum | 6.6 | NA | 0.452 | 0.387 | 490 | 50.0 | 4.95 | 409 | 45 | 2 | 330 | 31 | 472 | 235 | 0.72 |
| | Minimum | 4.6 | NA | 0.258 | 0.226 | 360 | 35.8 | 1.39 | 310 | 21 | 1 | 272 | 27 | 422 | 205 | 0.72 |
| | Mean | 5.8 | NA | 0.357 | 0.301 | 425 | 46.2 | 2.24 | 355 | 37 | 2 | 309 | 30 | 456 | 227 | 0.72 |
| | Standard deviation | 0.66 | NA | 0.0620 | 0.0565 | 45.1 | 5.18 | 1.387 | 32.7 | 8.9 | 0.4 | 21.3 | 2.0 | 18.8 | 11.3 | 0.000 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 14 | Maximum | 7.4 | NA | 0.478 | 0.452 | 500 | 55.8 | 5.94 | 367 | 32 | 3 | 293 | 34 | 369 | 212 | 1.43 |
| | Minimum | 5.5 | NA | 0.284 | 0.323 | 340 | 41.6 | 1.17 | 226 | 21 | 1 | 229 | 23 | 324 | 160 | 0.72 |
| | Mean | 6.4 | NA | 0.359 | 0.361 | 422 | 49.1 | 2.31 | 296 | 30 | 2 | 266 | 28 | 357 | 189 | 0.84 |
| | Standard deviation | 0.62 | NA | 0.0700 | 0.0517 | 59.5 | 4.97 | 1.822 | 46.4 | 4.5 | 0.7 | 23.1 | 5.2 | 17.9 | 16.7 | 0.292 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 28 | Maximum | 4.3 | NA | 0.258 | 0.323 | 540 | 40.8 | 2.49 | 437 | 20 | 2 | 349 | 32 | 584 | 277 | 0.72 |
| | Minimum | 3.1 | NA | 0.142 | 0.226 | 420 | 26.6 | 1.25 | 353 | 10 | 1 | 310 | 29 | 524 | 256 | 0.72 |
| | Mean | 3.8 | NA | 0.194 | 0.269 | 488 | 32.9 | 1.76 | 378 | 17 | 1 | 325 | 30 | 557 | 268 | 0.72 |
| | Standard deviation | 0.43 | NA | 0.0424 | 0.0486 | 43.6 | 5.31 | 0.439 | 32.7 | 3.5 | 0.4 | 17.3 | 1.1 | 19.7 | 8.2 | 0.000 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 7 | Maximum | 8.9 | NA | 0.426 | 0.420 | 560 | 66.6 | 2.88 | 522 | 21 | 2 | 400 | 32 | 362 | 226 | 0.72 |
| | Minimum | 5.0 | NA | 0.297 | 0.258 | 400 | 44.1 | 1.17 | 310 | 10 | 1 | 279 | 28 | 339 | 194 | 0.72 |
| | Mean | 6.9 | NA | 0.359 | 0.312 | 485 | 55.5 | 1.59 | 371 | 16 | 2 | 320 | 30 | 357 | 202 | 0.72 |
| | Standard deviation | 1.44 | NA | 0.0562 | 0.0601 | 54.7 | 10.03 | 0.642 | 75.5 | 3.3 | 0.5 | 43.6 | 1.6 | 8.8 | 12.2 | 0.000 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 6 |
| All Kukjuktuk Bay area lakes only | Maximum | 15.1 | NA | 1.085 | 0.484 | 560 | 146.5 | 5.94 | 536 | 94 | 6 | 470 | 58 | 584 | 277 | 1.43 |
| | Minimum | 3.1 | NA | 0.142 | 0.226 | 340 | 26.6 | 0.57 | 226 | 10 | 1 | 229 | 23 | 254 | 155 | 0.72 |
| | Mean | 6.9 | NA | 0.388 | 0.328 | 464 | 55.4 | 1.87 | 377 | 36 | 2 | 322 | 34 | 406 | 217 | 0.78 |
| | Standard deviation | 2.90 | NA | 0.1873 | 0.0673 | 58.6 | 24.49 | 1.088 | 77.9 | 26.2 | 1.2 | 51.2 | 10.9 | 93.4 | 32.0 | 0.184 |
| | n | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 26 | 30 | 30 | 30 | 30 | 30 |
| KUKJUKTUK BAY | Maximum | 5.4 | NA | 0.362 | 0.581 | 320 | 40.8 | 10.32 | 239774 | 10948 | 7 | 182174 | 6113 | 4716 | 21349 | 1.43 |
| | Minimum | 3.4 | NA | 0.245 | 0.387 | 120 | 29.1 | 7.51 | 81805 | 6243 | 3 | 70000 | 2072 | 1946 | 8145 | 0.72 |
| | Mean | 4.2 | NA | 0.307 | 0.452 | 262 | 34.1 | 8.85 | 132017 | 8017 | 5 | 103913 | 3069 | 2840 | 12316 | 0.86 |
| | Standard deviation | 0.85 | NA | 0.0442 | 0.0791 | 82.6 | 4.45 | 1.033 | 61750.7 | 1796.2 | 1.6 | 44642.0 | 1727.5 | 1088.0 | 5175.1 | 0.320 |
| | n | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

Table 10. Cont. (page 2 of 2).

| LOCATION** | | Inuvik TIC µmol/L | Total Alkal µeq/L | Organic acid µeq/L | pH at 25C | | Sp conductance at 25C µS/cm | | Chlorophyll-a µg/L | | In situ temp C | 10 cm absorbance at * | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | 455 nm | 543 nm | | |
| | | | | | FWI | In situ | FWI | In situ | FWI | Inuvik | | F & C | UF | F | F & C |
| KUK LAKE 10 | Maximum | 844 | 850 | 35 | 8.30 | 8.9 | 170 | 146 | 7.3 | 11.6 | 11.6 | 0.020 | 0.090 | 0.011 | 0.008 |
| | Minimum | 699 | 690 | 34 | 7.69 | 7.8 | 125 | 112 | 3.1 | 5.3 | 4.2 | 0.011 | 0.057 | 0.006 | 0.001 |
| | Mean | 753 | 783 | 35 | 8.02 | 8.2 | 152 | 133 | 4.4 | 6.9 | 7.6 | 0.016 | 0.073 | 0.009 | 0.004 |
| | Standard deviation | 55.0 | 57.9 | 0.7 | 0.237 | 0.36 | 14.8 | 11.2 | 1.51 | 2.39 | 2.78 | 0.0042 | 0.0136 | 0.0020 | 0.0030 |
| | n | 7 | 6 | 2 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 6 | 6 |
| KUK LAKE 18 | Maximum | 1270 | 1320 | 24 | 8.38 | 9.2 | 176 | 160 | 2.6 | 3.9 | 10.0 | 0.012 | 0.056 | 0.008 | 0.005 |
| | Minimum | 1159 | 1140 | 13 | 7.97 | 7.9 | 154 | 132 | 1.9 | 2.6 | 4.5 | 0.003 | 0.048 | 0.000 | -0.002 |
| | Mean | 1208 | 1265 | 17 | 8.18 | 8.5 | 169 | 153 | 2.2 | 3.2 | 7.1 | 0.008 | 0.051 | 0.005 | 0.001 |
| | Standard deviation | 36.0 | 65.3 | 6.1 | 0.144 | 0.40 | 8.0 | 9.6 | 0.27 | 0.42 | 2.36 | 0.0037 | 0.0031 | 0.0031 | 0.0028 |
| | n | 7 | 6 | 3 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 6 | 6 |
| KUK LAKE 14 | Maximum | 1020 | 1070 | 19 | 8.17 | 9.0 | 146 | 124 | 3.2 | 4.9 | 11.1 | 0.020 | 0.065 | 0.022 | 0.007 |
| | Minimum | 896 | 930 | 1 | 7.89 | 8.1 | 126 | 108 | 1.5 | 2.5 | 4.7 | 0.005 | 0.025 | 0.005 | -0.001 |
| | Mean | 957 | 1033 | 7 | 8.03 | 8.6 | 140 | 120 | 2.3 | 3.6 | 7.9 | 0.013 | 0.048 | 0.010 | 0.003 |
| | Standard deviation | 50.5 | 53.9 | 10.4 | 0.121 | 0.30 | 7.2 | 5.6 | 0.64 | 0.96 | 2.49 | 0.0056 | 0.0135 | 0.0061 | 0.0031 |
| | n | 7 | 6 | 3 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 6 | 6 |
| KUK LAKE 28 | Maximum | 1605 | 1630 | 15 | 8.51 | 8.9 | 203 | 197 | 1.7 | 2.0 | 10.4 | 0.010 | 0.035 | 0.008 | 0.005 |
| | Minimum | 1453 | 1560 | 8 | 8.14 | 8.1 | 187 | 178 | 1.0 | 1.6 | 6.1 | 0.002 | 0.020 | -0.002 | -0.003 |
| | Mean | 1515 | 1593 | 13 | 8.31 | 8.5 | 196 | 186 | 1.2 | 1.8 | 8.2 | 0.007 | 0.030 | 0.004 | 0.001 |
| | Standard deviation | 58.3 | 22.5 | 4.0 | 0.127 | 0.27 | 5.1 | 7.5 | 0.26 | 0.15 | 1.64 | 0.0033 | 0.0061 | 0.0037 | 0.0029 |
| | n | 7 | 6 | 3 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 6 | 6 |
| KUK LAKE 7 | Maximum | 1077 | 1080 | 12 | 8.21 | 9.0 | 147 | 130 | 3.0 | 5.0 | 10.2 | 0.018 | 0.039 | 0.010 | 0.007 |
| | Minimum | 1000 | 1010 | 4 | 7.97 | 7.9 | 136 | 120 | 1.8 | 2.5 | 3.8 | 0.004 | 0.025 | 0.001 | -0.002 |
| | Mean | 1025 | 1050 | 8 | 8.08 | 8.4 | 143 | 125 | 2.5 | 3.9 | 7.2 | 0.011 | 0.033 | 0.005 | 0.003 |
| | Standard deviation | 25.9 | 25.3 | 4.0 | 0.080 | 0.35 | 3.9 | 3.4 | 0.51 | 0.85 | 2.50 | 0.0055 | 0.0058 | 0.0035 | 0.0036 |
| | n | 7 | 6 | 3 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 6 | 6 | 6 |
| All Kukjuktuk Bay area lakes only | Maximum | 1605 | 1630 | 35 | 8.51 | 9.2 | 203 | 197 | 7.3 | 11.6 | 11.6 | 0.020 | 0.090 | 0.022 | 0.008 |
| | Minimum | 699 | 690 | 1 | 7.69 | 7.8 | 125 | 108 | 1.0 | 1.6 | 3.8 | 0.002 | 0.020 | -0.002 | -0.003 |
| | Mean | 1092 | 1145 | 14 | 8.12 | 8.5 | 160 | 143 | 2.5 | 3.9 | 7.6 | 0.011 | 0.047 | 0.007 | 0.003 |
| | Standard deviation | 264.4 | 279.4 | 10.7 | 0.178 | 0.34 | 22.5 | 25.6 | 1.28 | 2.03 | 2.28 | 0.0054 | 0.0180 | 0.0044 | 0.0031 |
| | n | 35 | 30 | 14 | 30 | 35 | 30 | 35 | 30 | 30 | 35 | 30 | 30 | 30 | 30 |
| KUKJUKTUK BAY | Maximum | 1796 | 2000 | 1 | 8.33 | 8.5 | 23200 | 25200 | 1.2 | 1.9 | 8.5 | 0.020 | 0.103 | 0.010 | 0.005 |
| | Minimum | 1194 | 1220 | 1 | 8.08 | 8.2 | 9050 | 10100 | 0.5 | 0.9 | 3.7 | 0.005 | 0.063 | 0.002 | -0.002 |
| | Mean | 1612 | 1642 | 1 | 8.18 | 8.4 | 13210 | 14982 | 0.9 | 1.4 | 6.1 | 0.013 | 0.080 | 0.006 | 0.003 |
| | Standard deviation | 214.8 | 294.1 | 0.0 | 0.106 | 0.12 | 5729.8 | 5935.8 | 0.26 | 0.36 | 2.07 | 0.0058 | 0.0166 | 0.0031 | 0.0029 |
| | n | 6 | 5 | 2 | 5 | 6 | 5 | 6 | 5 | 5 | 6 | 5 | 5 | 5 | 5 |

* UF = unfiltered, F = filtered, C = centrifuged
** Kuk = Kukjuktuk

Table 11. Maximum, minimum, mean, sample standard deviation and the sample size (n) of the Mackenzie Delta lakes and channels chemistry and water quality data in Table 5.

| LOCATION | Variable | SN µmol/L | TDN µmol/L | SP µmol/L | TDP µmol/L | DOC µmol/L | TSC µmol/L | SRSi µmol/L | Cl µmol/L | $SO_4$ µmol/L | FSS mg/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | TDFe µmol/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EAST CHANNEL | Maximum | 29.3 | NA | 5.760 | 0.517 | 570 | 517.9 | 58.72 | 197 | 312 | 314 | 321 | 27 | 841 | 353 | 2.69 |
| | Minimum | 5.6 | NA | 0.814 | 0.258 | 330 | 84.1 | 48.75 | 113 | 187 | 25 | 201 | 21 | 691 | 269 | 0.72 |
| | Mean | 11.2 | NA | 2.751 | 0.381 | 450 | 232.8 | 54.34 | 151 | 253 | 123 | 244 | 24 | 749 | 305 | 1.95 |
| | Standard deviation | 8.21 | NA | 1.7521 | 0.0911 | 77.9 | 159.94 | 3.08 | 29.8 | 45.2 | 93.7 | 41.3 | 1.8 | 47.0 | 30.3 | 0.662 |
| | n | 8 | 10 | 10 | 10 | 10 | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| BIG LAKE CHANNEL | Maximum | 23.1 | NA | 5.273 | 0.484 | 540 | 651.1 | 58.36 | 197 | 323 | 209 | 338 | 26 | 841 | 353 | 2.69 |
| | Minimum | 5.4 | NA | 0.749 | 0.258 | 330 | 82.4 | 48.40 | 113 | 187 | 22 | 199 | 21 | 694 | 266 | 0.72 |
| | Mean | 10.8 | NA | 2.411 | 0.366 | 433 | 264.7 | 54.41 | 154 | 260 | 96 | 250 | 24 | 754 | 307 | 1.65 |
| | Standard deviation | 6.42 | NA | 1.4963 | 0.0757 | 72.5 | 198.42 | 3.04 | 28.6 | 44.4 | 66.2 | 46.0 | 1.3 | 47.7 | 30.4 | 0.644 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| SOUTH LAKE | Maximum | 18.3 | NA | 0.633 | 0.581 | 820 | 67.4 | 55.87 | 183 | 271 | 9 | 285 | 36 | 921 | 350 | 5.37 |
| | Minimum | 3.0 | NA | 0.297 | 0.291 | 500 | 26.6 | 25.69 | 141 | 177 | 3 | 225 | 32 | 758 | 285 | 0.72 |
| | Mean | 7.3 | NA | 0.452 | 0.405 | 728 | 49.2 | 44.28 | 155 | 227 | 6 | 250 | 34 | 856 | 316 | 2.86 |
| | Standard deviation | 4.44 | NA | 0.1017 | 0.1120 | 103.1 | 11.87 | 11.92 | 17.3 | 31.6 | 2.2 | 20.9 | 1.5 | 61.8 | 22.7 | 1.797 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 9 | 9 | 9 | 9 | 9 |
| SOUTH LAKE BAY | Maximum | 10.1 | NA | 0.788 | 0.613 | 830 | 78.3 | 55.16 | 183 | 281 | 9 | 289 | 36 | 921 | 350 | 5.91 |
| | Minimum | 3.5 | NA | 0.271 | 0.291 | 630 | 29.1 | 9.61 | 141 | 177 | 3 | 230 | 30 | 761 | 282 | 0.72 |
| | Mean | 6.2 | NA | 0.441 | 0.409 | 760 | 50.4 | 40.10 | 155 | 236 | 4 | 251 | 34 | 827 | 318 | 2.79 |
| | Standard deviation | 2.01 | NA | 0.1749 | 0.1095 | 75.3 | 15.72 | 19.06 | 17.3 | 39.4 | 2.4 | 22.1 | 2.2 | 59.7 | 24.5 | 1.859 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 6 | 9 | 9 | 9 | 9 | 9 |
| SKIDOO LAKE | Maximum | 8.5 | NA | 1.408 | 0.549 | 770 | 110.7 | 56.23 | 169 | 297 | 45 | 291 | 33 | 886 | 348 | 3.94 |
| | Minimum | 3.3 | NA | 0.387 | 0.258 | 420 | 33.3 | 24.56 | 141 | 198 | 8 | 235 | 24 | 773 | 290 | 0.72 |
| | Mean | 6.1 | NA | 0.735 | 0.373 | 539 | 64.9 | 44.50 | 157 | 257 | 18 | 251 | 28 | 811 | 314 | 1.95 |
| | Standard deviation | 1.79 | NA | 0.3301 | 0.1022 | 127.1 | 25.12 | 12.30 | 14.9 | 36.9 | 11.9 | 22.6 | 2.7 | 43.7 | 20.7 | 1.196 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| BIG LAKE | Maximum | 25.1 | NA | 4.634 | 0.484 | 570 | 666.9 | 57.65 | 197 | 312 | 232 | 319 | 27 | 841 | 357 | 2.69 |
| | Minimum | 4.2 | NA | 0.478 | 0.258 | 350 | 60.0 | 43.77 | 113 | 187 | 15 | 205 | 23 | 706 | 269 | 0.72 |
| | Mean | 10.0 | NA | 2.012 | 0.380 | 452 | 207.9 | 52.35 | 154 | 257 | 79 | 247 | 24 | 763 | 307 | 1.81 |
| | Standard deviation | 7.79 | NA | 1.5548 | 0.0851 | 72.9 | 215.39 | 3.90 | 28.6 | 42.6 | 74.9 | 40.4 | 1.6 | 49.4 | 31.9 | 0.793 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| All Mackenzie Delta lakes and channels | Maximum | 29.3 | NA | 5.760 | 0.613 | 830 | 666.9 | 58.72 | 197 | 323 | 314 | 338 | 36 | 921 | 357 | 5.91 |
| | Minimum | 3.0 | NA | 0.271 | 0.258 | 330 | 26.6 | 9.61 | 113 | 177 | 3 | 199 | 21 | 691 | 266 | 0.72 |
| | Mean | 8.5 | NA | 1.490 | 0.386 | 558 | 143.3 | 48.44 | 154 | 249 | 62 | 249 | 28 | 793 | 311 | 2.16 |
| | Standard deviation | 5.79 | NA | 1.4708 | 0.0935 | 160.2 | 159.33 | 11.60 | 22.7 | 40.4 | 74.5 | 32.6 | 4.8 | 64.1 | 26.4 | 1.287 |
| | n | 53 | 55 | 55 | 55 | 55 | 53 | 55 | 55 | 55 | 49 | 55 | 55 | 55 | 55 | 55 |

Table 11. Cont. (page 2 of 2).

| LOCATION | Variable | Inuvik TIC µmol/L | Total Alkal µeq/L | Organic acid µeq/L | pH at 25C FWI | pH at 25C In situ | Sp conductance at 25C µS/cm FWI | Sp conductance at 25C µS/cm In situ | Chlorophyll-a µg/L FWI | Chlorophyll-a µg/L Inuvik | In situ temp C | 10 cm absorbance at * 455 nm F & C | 10 cm absorbance at * 543 nm UF | 10 cm absorbance at * 543 nm F | 10 cm absorbance at * 543 nm F & C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EAST CHANNEL | Maximum | 2016 | 2120 | 75 | 8.44 | 8.3 | 268 | 276 | 3.4 | 6.7 | 15.7 | 0.140 | 16.000 | 0.110 | 0.057 |
| | Minimum | 1634 | 1780 | 1 | 8.13 | 7.6 | 213 | 207 | 0.9 | 1.4 | 7.0 | 0.035 | 0.620 | 0.028 | 0.001 |
| | Mean | 1792 | 1881 | 49 | 8.27 | 8.1 | 237 | 236 | 1.8 | 3.0 | 12.3 | 0.065 | 3.304 | 0.052 | 0.023 |
| | Standard deviation | 100.1 | 109.9 | 25.5 | 0.090 | 0.21 | 18.0 | 23.1 | 0.78 | 1.61 | 2.59 | 0.0340 | 4.6190 | 0.0257 | 0.0157 |
| | n | 12 | 10 | 7 | 10 | 8 | 10 | 10 | 12 | 12 | 12 | 10 | 10 | 10 | 10 |
| BIG LAKE CHANNEL | Maximum | 1984 | 1960 | 80 | 8.44 | 8.8 | 269 | 277 | 3.4 | 6.5 | 15.5 | 0.108 | 3.950 | 0.090 | 0.043 |
| | Minimum | 1540 | 1740 | 13 | 8.13 | 7.6 | 213 | 206 | 0.9 | 1.4 | 10.3 | 0.031 | 0.575 | 0.026 | 0.000 |
| | Mean | 1736 | 1842 | 47 | 8.26 | 8.1 | 238 | 238 | 1.9 | 2.9 | 13.1 | 0.060 | 1.859 | 0.048 | 0.021 |
| | Standard deviation | 120.8 | 80.4 | 25.3 | 0.094 | 0.39 | 19.1 | 21.9 | 0.80 | 1.52 | 1.84 | 0.0259 | 1.2425 | 0.0209 | 0.0126 |
| | n | 9 | 9 | 6 | 9 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| SOUTH LAKE | Maximum | 2252 | 2180 | 83 | 8.40 | 8.9 | 276 | 285 | 5.8 | 7.9 | 17.5 | 0.157 | 0.315 | 0.120 | 0.063 |
| | Minimum | 1628 | 1700 | 9 | 8.10 | 7.3 | 221 | 230 | 1.9 | 3.0 | 8.6 | 0.040 | 0.080 | 0.015 | 0.007 |
| | Mean | 1906 | 1986 | 53 | 8.24 | 8.3 | 253 | 256 | 3.1 | 4.4 | 13.4 | 0.086 | 0.162 | 0.043 | 0.028 |
| | Standard deviation | 205.3 | 172.3 | 25.2 | 0.106 | 0.57 | 21.2 | 18.9 | 1.29 | 1.57 | 2.99 | 0.0438 | 0.0716 | 0.0359 | 0.0200 |
| | n | 9 | 9 | 6 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| SOUTH LAKE BAY | Maximum | 2104 | 2160 | 83 | 8.46 | 9.3 | 270 | 289 | 6.0 | 8.2 | 17.5 | 0.162 | 0.338 | 0.122 | 0.065 |
| | Minimum | 1519 | 1740 | 25 | 8.03 | 7.5 | 224 | 221 | 1.7 | 2.5 | 8.1 | 0.042 | 0.062 | 0.007 | 0.003 |
| | Mean | 1798 | 1916 | 61 | 8.27 | 8.4 | 250 | 254 | 3.1 | 4.5 | 13.4 | 0.084 | 0.131 | 0.041 | 0.028 |
| | Standard deviation | 196.5 | 164.9 | 21.4 | 0.140 | 0.69 | 16.1 | 21.5 | 1.37 | 1.75 | 3.08 | 0.0454 | 0.0879 | 0.0379 | 0.0207 |
| | n | 9 | 9 | 6 | 9 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| SKIDOO LAKE | Maximum | 1860 | 2010 | 83 | 8.54 | 8.8 | 282 | 269 | 4.0 | 5.3 | 16.7 | 0.135 | 1.150 | 0.080 | 0.052 |
| | Minimum | 1562 | 1750 | 1 | 8.12 | 7.8 | 230 | 237 | 1.1 | 1.9 | 8.0 | 0.030 | 0.166 | 0.015 | 0.000 |
| | Mean | 1749 | 1848 | 51 | 8.27 | 8.3 | 247 | 249 | 2.6 | 3.7 | 12.8 | 0.067 | 0.471 | 0.037 | 0.022 |
| | Standard deviation | 111.5 | 89.8 | 30.4 | 0.131 | 0.37 | 17.4 | 10.5 | 0.98 | 1.19 | 2.79 | 0.0408 | 0.2943 | 0.0240 | 0.0179 |
| | n | 9 | 9 | 6 | 9 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| BIG LAKE | Maximum | 1918 | 2020 | 71 | 8.42 | 8.7 | 266 | 270 | 2.6 | 5.9 | 16.2 | 0.108 | 4.130 | 0.095 | 0.043 |
| | Minimum | 1640 | 1680 | 1 | 8.14 | 7.8 | 213 | 205 | 1.0 | 1.8 | 9.4 | 0.028 | 0.410 | 0.023 | 0.005 |
| | Mean | 1750 | 1823 | 53 | 8.26 | 8.3 | 238 | 236 | 1.7 | 3.1 | 12.8 | 0.062 | 1.612 | 0.051 | 0.021 |
| | Standard deviation | 83.1 | 94.2 | 26.9 | 0.081 | 0.33 | 18.5 | 20.8 | 0.66 | 1.48 | 2.17 | 0.0275 | 1.3037 | 0.0238 | 0.0126 |
| | n | 9 | 9 | 6 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| All Mackenzie Delta lakes and channels | Maximum | 2252 | 2180 | 83 | 8.54 | 9.3 | 282 | 289 | 6.0 | 8.2 | 17.5 | 0.162 | 16.000 | 0.122 | 0.065 |
| | Minimum | 1519 | 1680 | 1 | 8.03 | 7.3 | 213 | 205 | 0.9 | 1.4 | 7.0 | 0.028 | 0.062 | 0.007 | 0.000 |
| | Mean | 1789 | 1883 | 52 | 8.26 | 8.2 | 244 | 245 | 2.4 | 3.6 | 12.9 | 0.071 | 1.294 | 0.045 | 0.024 |
| | Standard deviation | 146.7 | 130.0 | 24.5 | 0.104 | 0.45 | 18.8 | 20.9 | 1.13 | 1.61 | 2.53 | 0.0368 | 2.3284 | 0.0279 | 0.0164 |
| | n | 57 | 55 | 37 | 55 | 50 | 55 | 55 | 57 | 57 | 57 | 55 | 55 | 55 | 55 |

* UF = unfiltered, F = filtered, C = centrifuged

Table 12. Maximum, minimum, mean, sample standard deviation and sample size (n) of the results calculated in Table 7 for the Kukjuktuk lakes and Kukjuktuk Bay. For a detailed explanation of the variables see Table 7.

| | Column | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MOLAR RATIOS | | | | ALKALINITY and INORGANIC CARBON | | | | | | | SPECIFIC CONDUCTANCE | | | | |
| | | Ratio of | | | | DA | DIC | | TIC from SA/2 + DIC | | | | | Calculated spec conductance using $HCO_3$ & $CO_3$ calc from DIC | Difference from observed sp cond in situ | | |
| | | SP to SP | SN to SP | TSC to SP | TSC/SN | Calculated ion equivalents | from ion equivalents | SA= TA-DA | SIC= TIC-DIC | | Difference (obs-calc) | | Sp cond Difference FWI-in situ | | | | FWI |
| LOCATION* | STATISTIC | | | | | µeq/L | µmol/L | µeq/L | µmol/L | µmol/L | µmol/L | DA/TA | µS/cm | µS/cm | µS/cm | µS/cm | µS/cm |
| KUK LAKE 10 | Minimum | 1 | 14 | 118 | 7 | 726 | 739 | -98 | -156 | 738 | -106 | 0.918 | 13 | 129 | 134 | -35 | -22 |
| | Maximum | 1 | 22 | 161 | 10 | 924 | 938 | 65 | 5 | 901 | -17 | 1.131 | 31 | 181 | 189 | -17 | -5 |
| | Mean | 1 | 18 | 141 | 8 | 813 | 819 | -30 | -72 | 804 | -58 | 1.039 | 21 | 160 | 167 | -29 | -15 |
| | Standard deviation | 0 | 3 | 15 | 1 | 74 | 73 | 60 | 65 | 54 | 39 | 0.0762 | 7 | 18 | 19 | 6 | 7 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 18 | Minimum | 1 | 15 | 111 | 8 | 1179 | 1169 | -61 | -119 | 1218 | -95 | 0.900 | 9 | 160 | 169 | -28 | -26 |
| | Maximum | 1 | 18 | 139 | 9 | 1328 | 1314 | 131 | 60 | 1295 | -5 | 1.054 | 22 | 183 | 193 | -20 | -11 |
| | Mean | 1 | 16 | 131 | 8 | 1274 | 1264 | -9 | -54 | 1259 | -50 | 1.009 | 16 | 177 | 186 | -25 | -18 |
| | Standard deviation | 0 | 1 | 11 | 0 | 66 | 57 | 74 | 70 | 32 | 38 | 0.0576 | 5 | 9 | 9 | 3 | 5 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 14 | Minimum | 1 | 14 | 106 | 7 | 965 | 965 | -51 | -106 | 964 | -112 | 0.921 | 17 | 128 | 133 | -28 | -16 |
| | Maximum | 1 | 20 | 150 | 8 | 1071 | 1065 | 84 | -4 | 1069 | -15 | 1.050 | 22 | 150 | 157 | -20 | -7 |
| | Mean | 1 | 18 | 139 | 8 | 1031 | 1027 | 2 | -60 | 1029 | -61 | 0.999 | 20 | 145 | 152 | -25 | -12 |
| | Standard deviation | 0 | 2 | 17 | 0 | 44 | 44 | 47 | 35 | 38 | 32 | 0.0454 | 2 | 9 | 9 | 3 | 3 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 28 | Minimum | 1 | 17 | 158 | 8 | 1434 | 1437 | -51 | -149 | 1519 | -123 | 0.896 | 1 | 199 | 208 | -27 | -32 |
| | Maximum | 1 | 22 | 193 | 10 | 1678 | 1711 | 166 | 144 | 1687 | 61 | 1.033 | 17 | 211 | 223 | -11 | -11 |
| | Mean | 1 | 20 | 172 | 9 | 1592 | 1585 | 1 | -64 | 1585 | -65 | 0.999 | 9 | 206 | 217 | -19 | -21 |
| | Standard deviation | 0 | 2 | 17 | 1 | 83 | 90 | 83 | 105 | 57 | 65 | 0.0517 | 6 | 4 | 5 | 6 | 7 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| KUK LAKE 7 | Minimum | 1 | 16 | 142 | 8 | 1000 | 996 | -53 | -91 | 1026 | -73 | 0.943 | 6 | 146 | 154 | -44 | -30 |
| | Maximum | 1 | 22 | 163 | 9 | 1106 | 1131 | 60 | 5 | 1107 | -9 | 1.052 | 25 | 168 | 175 | -21 | -9 |
| | Mean | 1 | 19 | 154 | 8 | 1065 | 1065 | -15 | -40 | 1057 | -32 | 1.015 | 18 | 154 | 161 | -28 | -18 |
| | Standard deviation | 0 | 2 | 8 | 0 | 36 | 50 | 43 | 32 | 35 | 22 | 0.0413 | 7 | 8 | 7 | 8 | 7 |
| | n | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| KUK BAY | Minimum | 1 | 12 | 103 | 7 | | | | | | | -10.627 | | | | | |
| | Maximum | 1 | 15 | 119 | 9 | | | | | | | -1.650 | | | | | |
| | Mean | 1 | 14 | 111 | 8 | | | | | | | -6.150 | | | | | |
| | Standard deviation | 0 | 1 | 6 | 1 | | | | | | | 3.3626 | | | | | |
| | n | 5 | 5 | 5 | 5 | | | | | | | 5 | | | | | |
| Kukjuktuk lakes, including Lake 33, only | Minimum | 1 | 14 | 106 | 7 | 723 | 739 | -98 | -156 | 738 | -123 | 0.896 | 1 | 108 | 113 | -44 | -32 |
| | Maximum | 1 | 22 | 193 | 10 | 1678 | 1711 | 166 | 144 | 1687 | 61 | 1.131 | 31 | 211 | 223 | -11 | -5 |
| | Mean | 1 | 18 | 148 | 8 | 1141 | 1139 | -10 | -58 | 1134 | -53 | 1.013 | 17 | 166 | 175 | -25 | -16 |
| | Standard deviation | 0 | 2 | 19 | 1 | 280 | 274 | 59 | 62 | 275 | 40 | 0.0532 | 7 | 26 | 28 | 6 | 7 |
| | n | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |

* Kuk = Kukjuktuk

Table 13. Maximum, minimum, mean, sample standard deviation and sample size (n) of the results calculated in Table 8 for the Mackenzie Delta lakes and channels. For a detailed explanation of the variables see Table 8.

| | Column | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MOLAR RATIOS | | | | ALKALINITY and INORGANIC CARBON | | | | | | | SPECIFIC CONDUCTANCE | | | | |
| | | Ratio of | | | | DA | DIC | | TIC from SA/2 + DIC | | | | | Calculated spec conductance | | Difference from observed sp cond | |
| LOCATION | STATISTIC | SP to SP | SN | TSC | TSC/SN | Calculated from ion equivalents µeq/L | | SA= TA-DA µeq/L | SIC= TIC-DIC µmol/L | | Difference (obs-calc) µmol/L | DA/TA | Sp cond Difference FWI-in situ µS/cm | using $HCO_3$ & $CO_3$ calc from in sit µS/cm | DIC FWI µS/cm | in situ obs-calc µS/cm | FWI obs-calc µS/cm |
| | | | | | | | µmol/L | | | µmol/L | | | | | | | |
| EAST CHANNEL | Minimum | 1 | 2 | 45 | 15 | 1543 | 1569 | -27 | -129 | 1687 | -143 | 0.800 | -15 | 230 | 240 | -43 | -38 |
| | Maximum | 1 | 8 | 148 | 26 | 1911 | 1943 | 424 | 319 | 1952 | 189 | 1.015 | 17 | 294 | 306 | -2 | -17 |
| | Mean | 1 | 5 | 112 | 21 | 1718 | 1739 | 163 | 67 | 1832 | -26 | 0.915 | 1 | 249 | 265 | -21 | -28 |
| | Standard deviation | 0 | 2 | 34 | 4 | 116 | 125 | 150 | 177 | 100 | 122 | 0.0741 | 11 | 22 | 23 | 11 | 7 |
| | n | 10 | 8 | 8 | 8 | 10 | 8 | 10 | 8 | 8 | 8 | 10 | 10 | 8 | 10 | 8 | 10 |
| BIG LAKE CHANNEL | Minimum | 1 | 2 | 43 | 15 | 1549 | 1573 | -42 | -228 | 1697 | -301 | 0.842 | -16 | 229 | 239 | -45 | -40 |
| | Maximum | 1 | 7 | 127 | 28 | 1908 | 1919 | 291 | 411 | 1953 | 266 | 1.023 | 18 | 296 | 309 | -3 | -16 |
| | Mean | 1 | 5 | 108 | 23 | 1722 | 1756 | 121 | -23 | 1815 | -82 | 0.935 | 0 | 256 | 268 | -19 | -30 |
| | Standard deviation | 0 | 1 | 27 | 5 | 122 | 118 | 119 | 205 | 88 | 181 | 0.0633 | 10 | 24 | 23 | 13 | 7 |
| | n | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 8 | 8 | 8 | 9 | 9 | 8 | 9 | 8 | 9 |
| SOUTH LAKE | Minimum | 1 | 6 | 57 | 3 | 1789 | 1806 | -151 | -490 | 1811 | -415 | 0.926 | -11 | 245 | 256 | -45 | -40 |
| | Maximum | 1 | 43 | 151 | 9 | 2179 | 2156 | 162 | 253 | 2123 | 172 | 1.089 | 20 | 300 | 316 | -4 | -22 |
| | Mean | 1 | 17 | 113 | 8 | 2018 | 2053 | -33 | -147 | 2037 | -131 | 1.019 | -3 | 277 | 290 | -21 | -36 |
| | Standard deviation | 0 | 11 | 31 | 2 | 129 | 106 | 96 | 228 | 94 | 195 | 0.0492 | 11 | 20 | 21 | 12 | 6 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| SOUTH LAKE BAY | Minimum | 1 | 8 | 66 | 7 | 1809 | 1686 | -131 | -379 | 1651 | -327 | 0.921 | -19 | 247 | 258 | -50 | -39 |
| | Maximum | 1 | 20 | 167 | 9 | 2146 | 2170 | 161 | 163 | 2152 | 82 | 1.075 | 36 | 289 | 309 | -13 | -26 |
| | Mean | 1 | 15 | 123 | 8 | 1947 | 1931 | -32 | -146 | 1911 | -126 | 1.019 | -4 | 269 | 285 | -20 | -35 |
| | Standard deviation | 0 | 4 | 37 | 0 | 135 | 188 | 88 | 188 | 181 | 153 | 0.0456 | 16 | 13 | 16 | 12 | 5 |
| | n | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 8 | 8 | 8 | 9 | 9 | 8 | 9 | 8 | 9 |
| SKIDOO LAKE | Minimum | 1 | 4 | 40 | 7 | 1682 | 1691 | -91 | -364 | 1798 | -318 | 0.885 | -15 | 252 | 264 | -50 | -43 |
| | Maximum | 1 | 15 | 112 | 13 | 2030 | 1996 | 218 | 169 | 1986 | 60 | 1.051 | 21 | 295 | 310 | -8 | -22 |
| | Mean | 1 | 9 | 93 | 10 | 1859 | 1882 | -11 | -120 | 1874 | -111 | 1.007 | -2 | 269 | 281 | -21 | -34 |
| | Standard deviation | 0 | 3 | 23 | 2 | 114 | 104 | 97 | 171 | 70 | 133 | 0.0522 | 11 | 16 | 17 | 13 | 6 |
| | n | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 8 | 8 | 8 | 9 | 9 | 8 | 9 | 8 | 9 |
| BIG LAKE | Minimum | 1 | 1 | 52 | 12 | 1587 | 1580 | -88 | -182 | 1716 | -250 | 0.849 | -9 | 230 | 242 | -47 | -41 |
| | Maximum | 1 | 10 | 144 | 36 | 1938 | 1914 | 305 | 338 | 1942 | 202 | 1.047 | 19 | 294 | 307 | -5 | -17 |
| | Mean | 1 | 6 | 99 | 19 | 1743 | 1757 | 80 | -7 | 1797 | -47 | 0.958 | 2 | 258 | 269 | -22 | -31 |
| | Standard deviation | 0 | 2 | 30 | 8 | 122 | 111 | 146 | 166 | 83 | 137 | 0.0766 | 10 | 22 | 23 | 11 | 8 |
| | n | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| Delta lakes and channels | Minimum | 1 | 1 | 40 | 3 | 1543 | 1569 | -151 | -490 | 1651 | -415 | 0.800 | -19 | 229 | 239 | -50 | -43 |
| | Maximum | 1 | 43 | 167 | 36 | 2179 | 2170 | 424 | 411 | 2152 | 266 | 1.089 | 36 | 300 | 316 | -2 | -16 |
| | Mean | 1 | 10 | 108 | 15 | 1832 | 1855 | 50 | -63 | 1879 | -87 | 0.974 | -1 | 263 | 276 | -21 | -32 |
| | Standard deviation | 0 | 7 | 31 | 7 | 166 | 169 | 138 | 198 | 132 | 153 | 0.0723 | 11 | 21 | 22 | 11 | 7 |
| | n | 55 | 53 | 53 | 53 | 55 | 50 | 55 | 50 | 50 | 50 | 55 | 55 | 50 | 55 | 50 | 55 |
| Delta lakes and channels (with some deletions) | Minimum | | | | | | | | | | | | -19 | | | -27 | -43 |
| | Maximum | | | | | | | | | | | | 1 | | | -13 | -26 |
| | Mean | | | | | | | | | | | | -8 | | | -19 | -36 |
| | Standard deviation | | | | | | | | | | | | 4.6 | | | 3.6 | 3.6 |
| | n | | | | | | | | | | | | 37 | | | 37 | 41 |
| | number of deletions | | | | | | | | | | | | 18 | | | 13 | 14 |

Table 14. A list of 26 outlying data points observed in Fig. 27. These points are referred to in the text by the group number in the column entitled "Group".

| Group | Plot Symbols | Anal # B- | LOCATION | Date | # of day | Specific conductance at 25C Observed FWI µS/cm | Observed In situ µS/cm | Calculated FWI µS/cm | Calculated In situ µS/cm | In comparison FWI vs In situ | Calculated vs FWI | Calculated vs In situ | Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 3 | EAST CHANNEL | 15-Jun | 166 | 226 | 209 | 243 | 231 | a | b | | i |
| | H | 5 | BIG LAKE | 18-Jun | 169 | 225 | 210 | 242 | 230 | a | b | | i |
| | C | 6 | BIG LAKE CHANNEL | 18-Jun | 169 | 220 | 213 | 242 | 230 | a | b | | i |
| | A | 10 | EAST CHANNEL | 18-Jun | 169 | 219 | 213 | 241 | 229 | a | b | | i |
| | H | 12 | BIG LAKE | 23-Jun | 174 | 213 | 205 | 243 | 232 | a | | | ii |
| | C | 13 | BIG LAKE CHANNEL | 23-Jun | 174 | 213 | 206 | 239 | 229 | a | | | ii |
| | A | 17 | EAST CHANNEL | 23-Jun | 174 | 213 | 207 | 240 | 230 | a | | | ii |
| | H | 20 | BIG LAKE | 28-Jun | 179 | 221 | 221 | 253 | 243 | a | | | ii |
| | A | 25 | EAST CHANNEL | 28-Jun | 179 | 223 | 221 | 255 | 244 | a | | | ii |
| | C | 47 | BIG LAKE CHANNEL | 15-Jul | 196 | 243 | 237 | 269 | 258 | a | b | | i |
| | A | 51 | EAST CHANNEL | 15-Jul | 196 | 239 | 238 | 265 | 254 | | b | | iii |
| 4 | E | 73 | SOUTH LAKE | 29-Jul | 210 | 264 | 255 | 303 | 291 | a | | c | iv |
| 2 | H | 89 | BIG LAKE | 13-Aug | 225 | 248 | 251 | 267 | 256 | | b | c | v |
| | C | 90 | BIG LAKE CHANNEL | 13-Aug | 225 | 248 | 251 | 264 | 254 | | b | c | v |
| | G | 91 | SKIDOO LAKE | 13-Aug | 225 | 254 | 257 | 276 | 265 | | b | c | v |
| | F | 92 | SOUTH LAKE BAY | 13-Aug | 225 | 266 | 267 | 292 | 280 | | b | | iii |
| | E | 93 | SOUTH LAKE | 13-Aug | 225 | 275 | 280 | 297 | 284 | | b | c | v |
| | A | 94 | EAST CHANNEL | 13-Aug | 225 | 249 | 256 | 268 | 258 | | b | c | v |
| 3 | H | 114 | BIG LAKE | 29-Aug | 241 | 266 | 247 | 307 | 294 | a | | c | iv |
| | G | 115 | SKIDOO LAKE | 29-Aug | 241 | 266 | 245 | 309 | 295 | a | | c | iv |
| | C | 116 | BIG LAKE CHANNEL | 29-Aug | 241 | 269 | 251 | 309 | 296 | a | | c | iv |
| | F | 117 | SOUTH LAKE BAY | 29-Aug | 241 | 257 | 221 | 284 | 272 | a | b | c | vi |
| | E | 118 | SOUTH LAKE | 29-Aug | 241 | 275 | 255 | 314 | 300 | a | | c | iv |
| | A | 119 | EAST CHANNEL | 29-Aug | 241 | 268 | 251 | 306 | 294 | a | | c | iv |
| 4 | G | 133 | SKIDOO LAKE | 10-Sep | 253 | 282 | 269 | 310 | 295 | a | b | | i |
| | C | 135 | BIG LAKE CHANNEL | 10-Sep | 253 | 261 | 277 | 297 | 284 | | | c | vii |
| | 26 samples | | | | | | | | | 18 | 14 | 13 | |

Codes
- i Observed FWI measurement too high.
- ii Observed FWI measurement too high or in situ too low.
- iii Observed FWI measurement too high or calculated FWI too low.
- iv Observed in situ too low.
- v Calculated in situ and calculated FWI too high.
- vi Observed in situ too low and observed FWI too high.
- vii Observed in situ too high or calculated in situ too low.

Table 15. Concentration of major anions and cations of Kukjuktuk Bay samples relative to average (35 per mill) seawater.

| Station number | Anal # B- | Date 1985 | # of day | Cl µmol/L | $SO_4$ µmol/L | Na µmol/L | K µmol/L | Ca µmol/L | Mg µmol/L | FWI Sp cond @25C µS/cm | In situ Sp cond @25C µS/cm | Mean | Standard Deviation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | 53 | 18-Jul | 199 | 81805 | 6243 | 70000 | 2097 | 1946 | 8145 | 9050 | 10100 | | |
| 68 | 76 | 31-Jul | 212 | 115656 | 7284 | 92174 | 2251 | 2323 | 10654 | 10100 | 10900 | | |
| 84 | 96 | 15-Aug | 227 | 110014 | 7284 | 83913 | 2072 | 2545 | 10366 | 11200 | 11800 | | |
| 98 | 110 | 27-Aug | 239 | 112835 | 8325 | 91304 | 2813 | 2670 | 11065 | 12500 | 12840 | | |
| 106 | 173 | 07-Sep | 250 | NA | NA | NA | NA | NA | NA | NA | 19050 | | |
| 118 | 144 | 12-Sep | 255 | 239774 | 10948 | 182174 | 6113 | 4716 | 21349 | 23200 | 25200 | | |
| The value in 35 per mill ocean water at 20C *. | | | | 559140 | 28820 | 479170 | 10230 | 10640 | 54570 | 53025 | 53025 | | |
| Composition of sample relative to 35 per mill ocean water | | | | 0.146 | 0.217 | 0.146 | 0.205 | 0.183 | 0.149 | 0.171 | 0.190 | 0.174 | 0.029 |
| | | | | 0.207 | 0.253 | 0.192 | 0.220 | 0.218 | 0.195 | 0.190 | 0.206 | 0.211 | 0.022 |
| | | | | 0.197 | 0.253 | 0.175 | 0.203 | 0.239 | 0.190 | 0.211 | 0.223 | 0.210 | 0.027 |
| | | | | 0.202 | 0.289 | 0.191 | 0.275 | 0.251 | 0.203 | 0.236 | 0.242 | 0.235 | 0.038 |
| | | | | NA | NA | NA | NA | NA | NA | NA | 0.359 | 0.359 | NA |
| | | | | 0.429 | 0.380 | 0.380 | 0.598 | 0.443 | 0.391 | 0.438 | 0.475 | 0.437 | 0.076 |

* Concentrations in milliequivalents/L from Dietrich (1963). The density of 35 per mill ocean water used to convert units from g/Kg to µmol/L was estimated from Strickland and Parsons (1972). Specific conductance at 25C of 35 per mill seawater was estimated from Riley and Skirrow (1975).

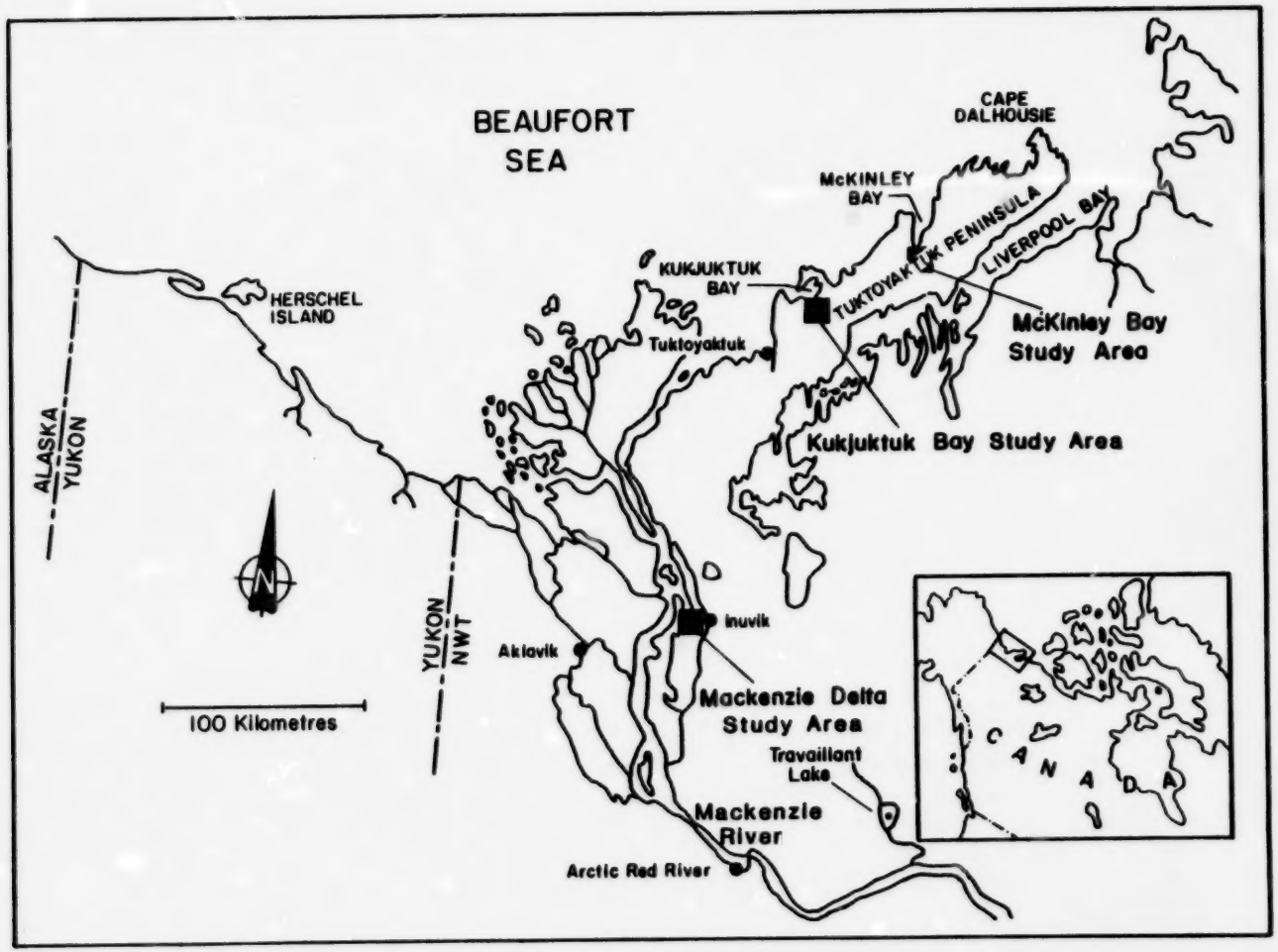



Fig. 1. Map of the Tuktoyaktuk peninsula, the Mackenzie Delta and Travaillant Lake. The McKinley Bay, Kukjuktuk Bay and Mackenzie Delta study areas are shown as black squares. Sampling sites are marked with a dot. (Adapted from Bond and Erickson 1985.)

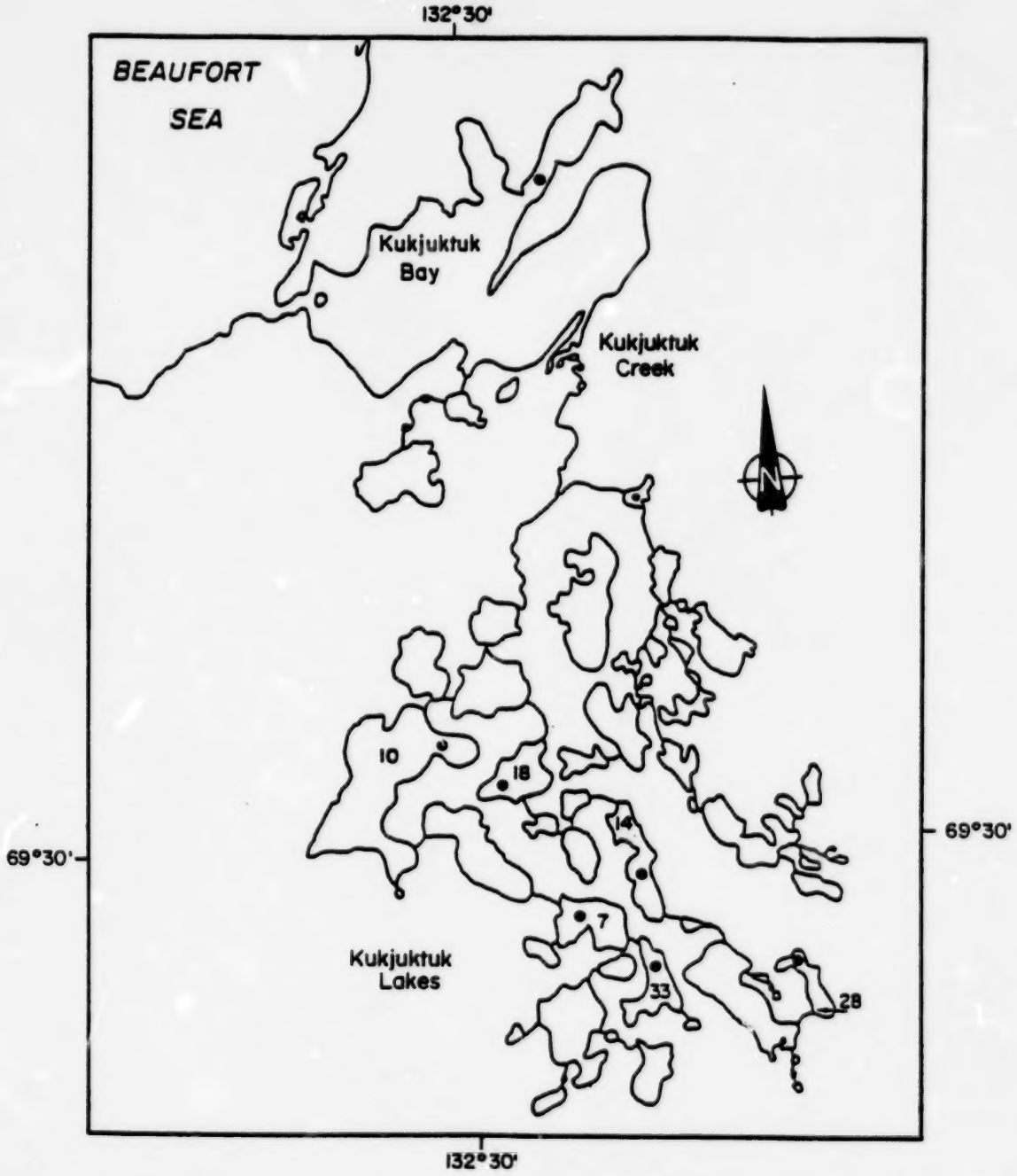



Fig. 2. Enlarged map of the Kukjuktuk Bay study area. The lakes studied are indicated by number. Sampling sites are marked with a dot. (Adapted from Fee et al. 1988.)

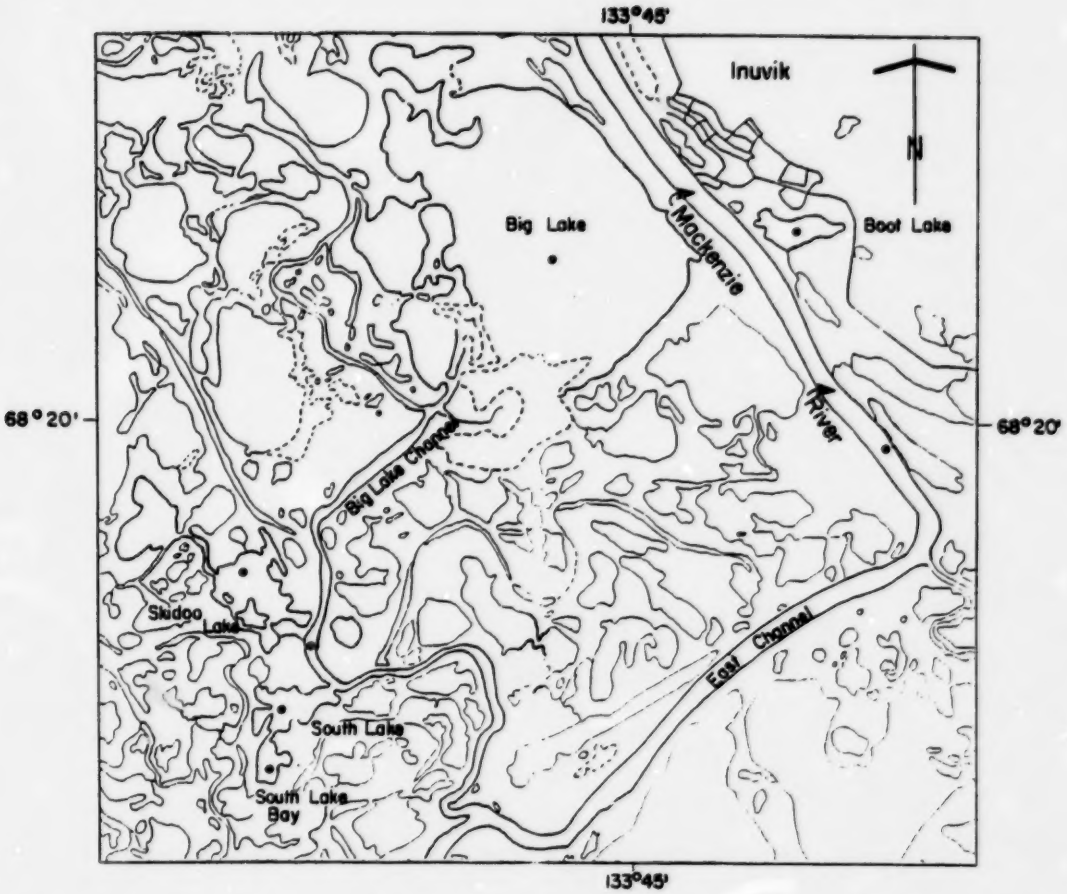



Fig. 3. Enlarged map of the Mackenzie Delta study area. The lakes and channels studied are indicated by name. Sampling sites are marked with a dot. (Adapted from Fee et al. 1988.)

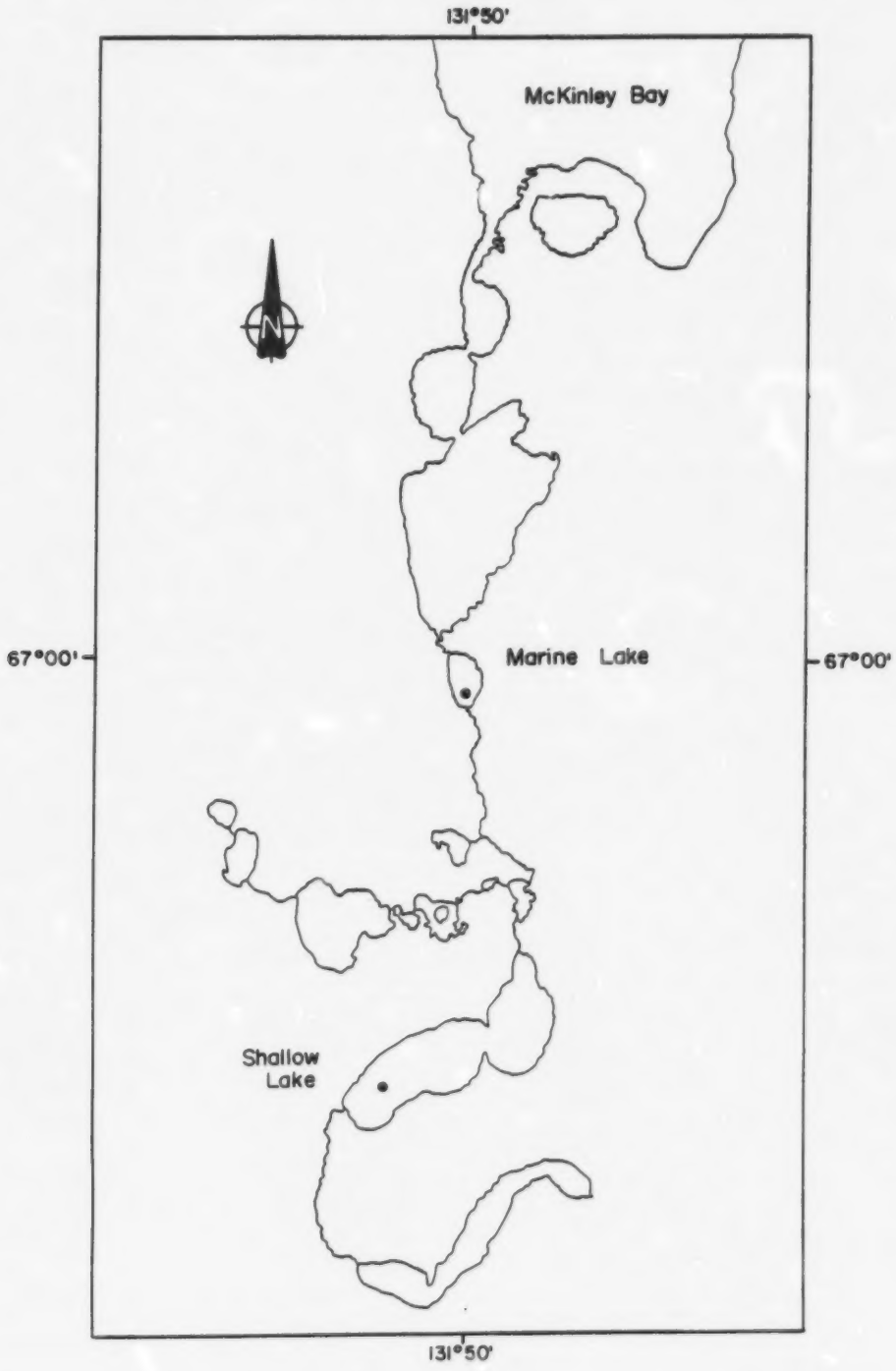



Fig. 4. Enlarged map of the McKinley Bay study area. The lakes studied are indicated by name. Sampling sites are marked with a dot. (Adapted from Strange and MacDonell 1985.)

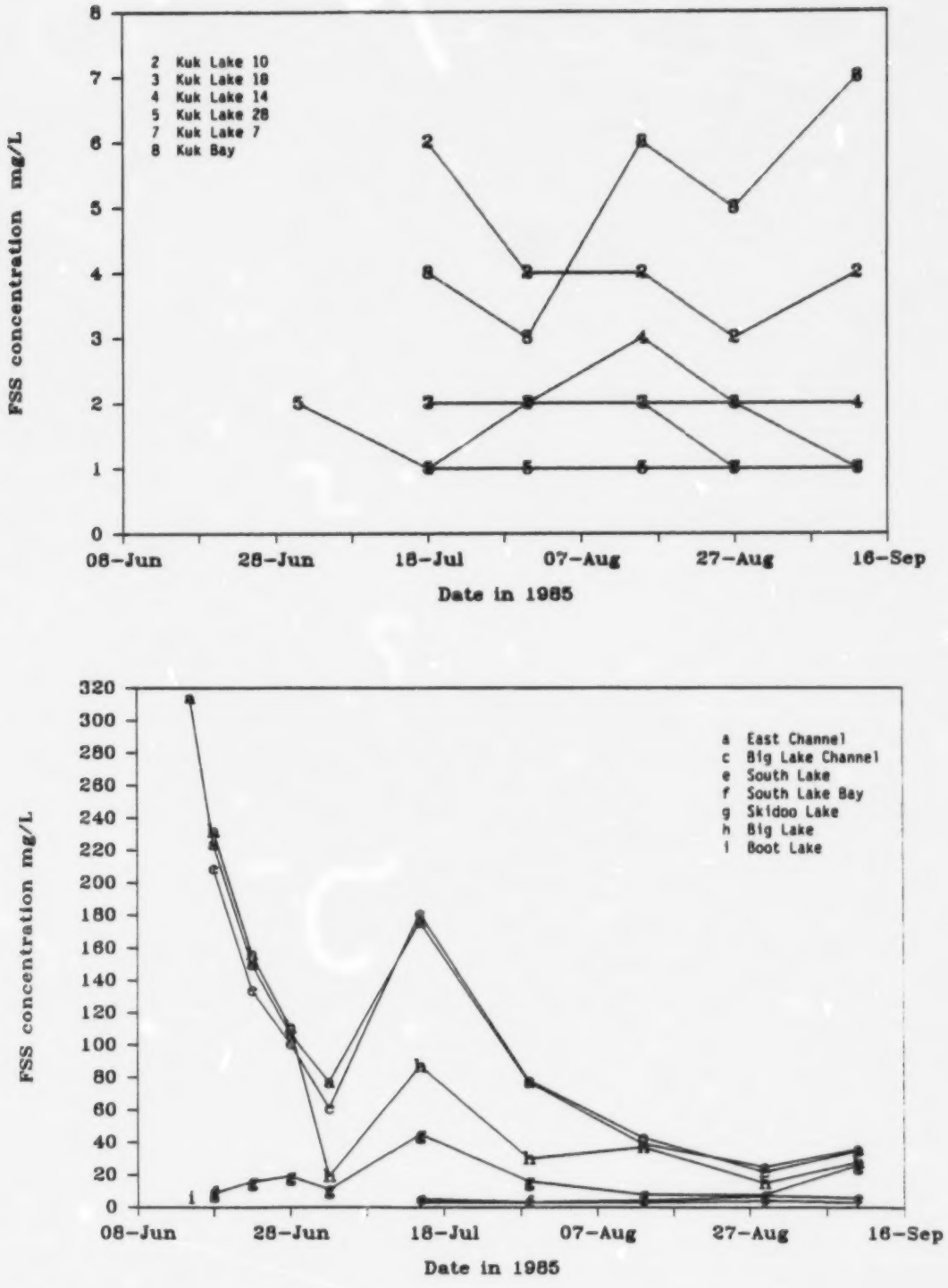



Fig. 5. Filtered suspended solids concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

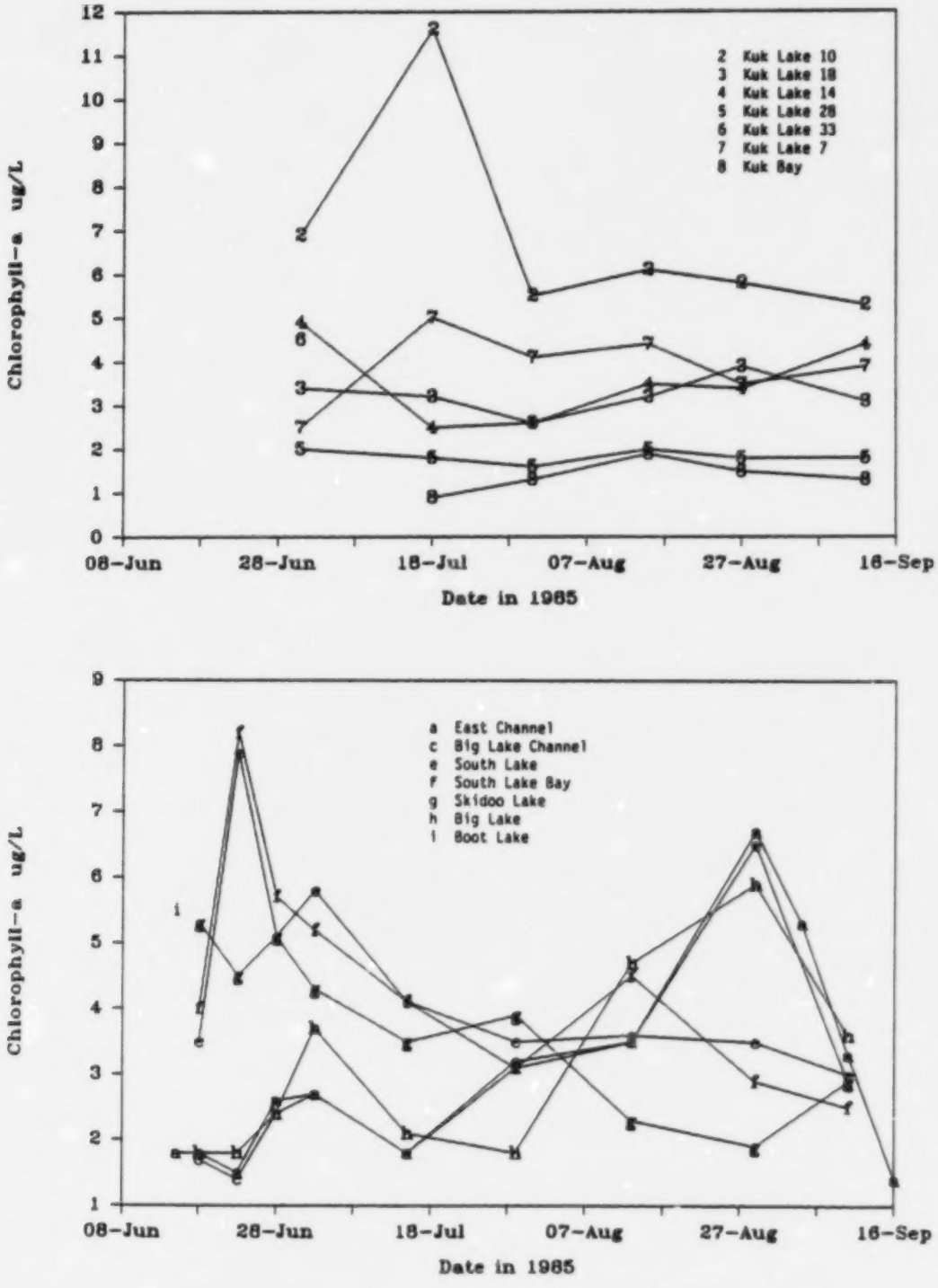



Fig. 6. Inuvik chlorophyll-a concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

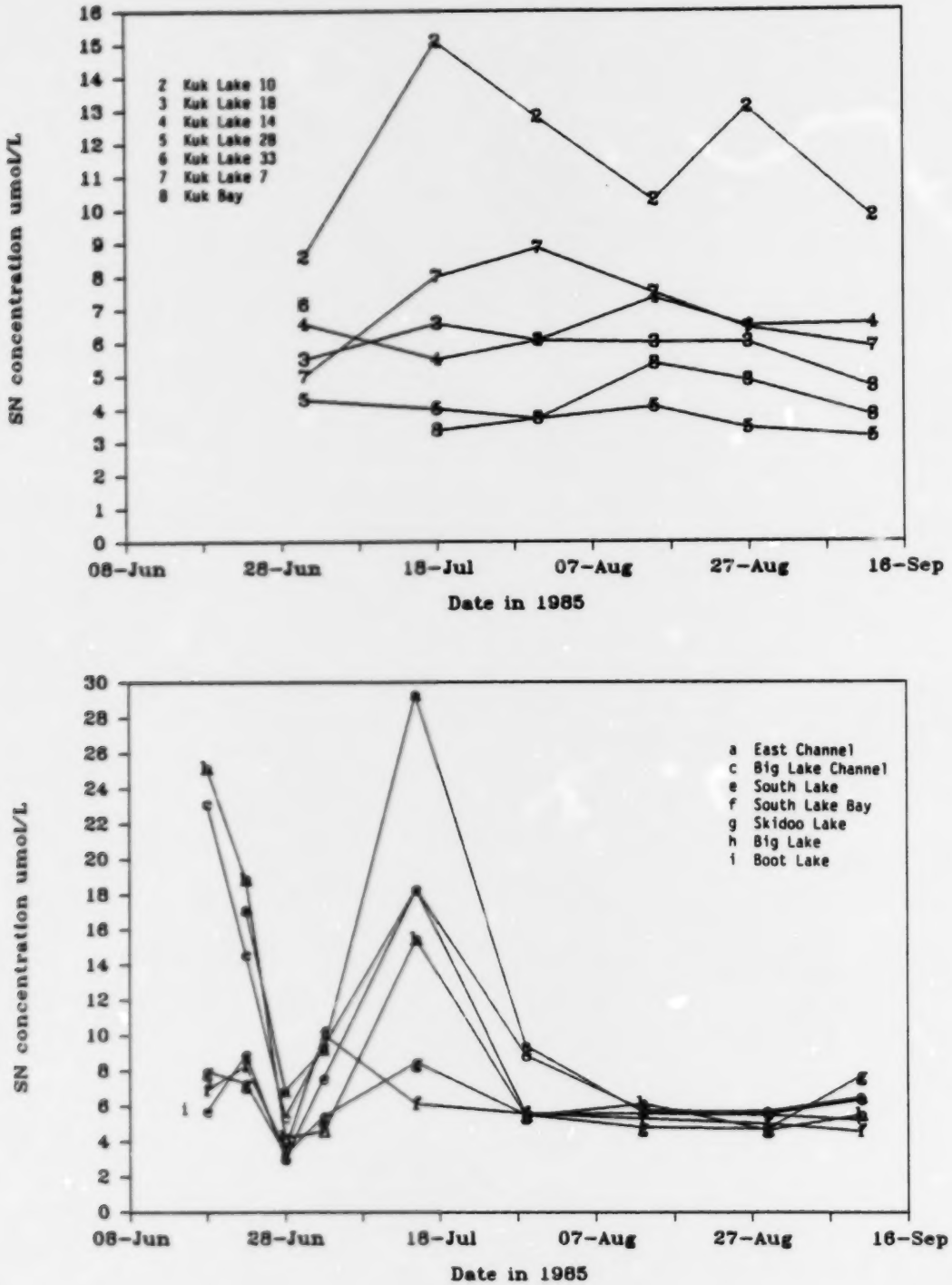



Fig. 7. Suspended nitrogen concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

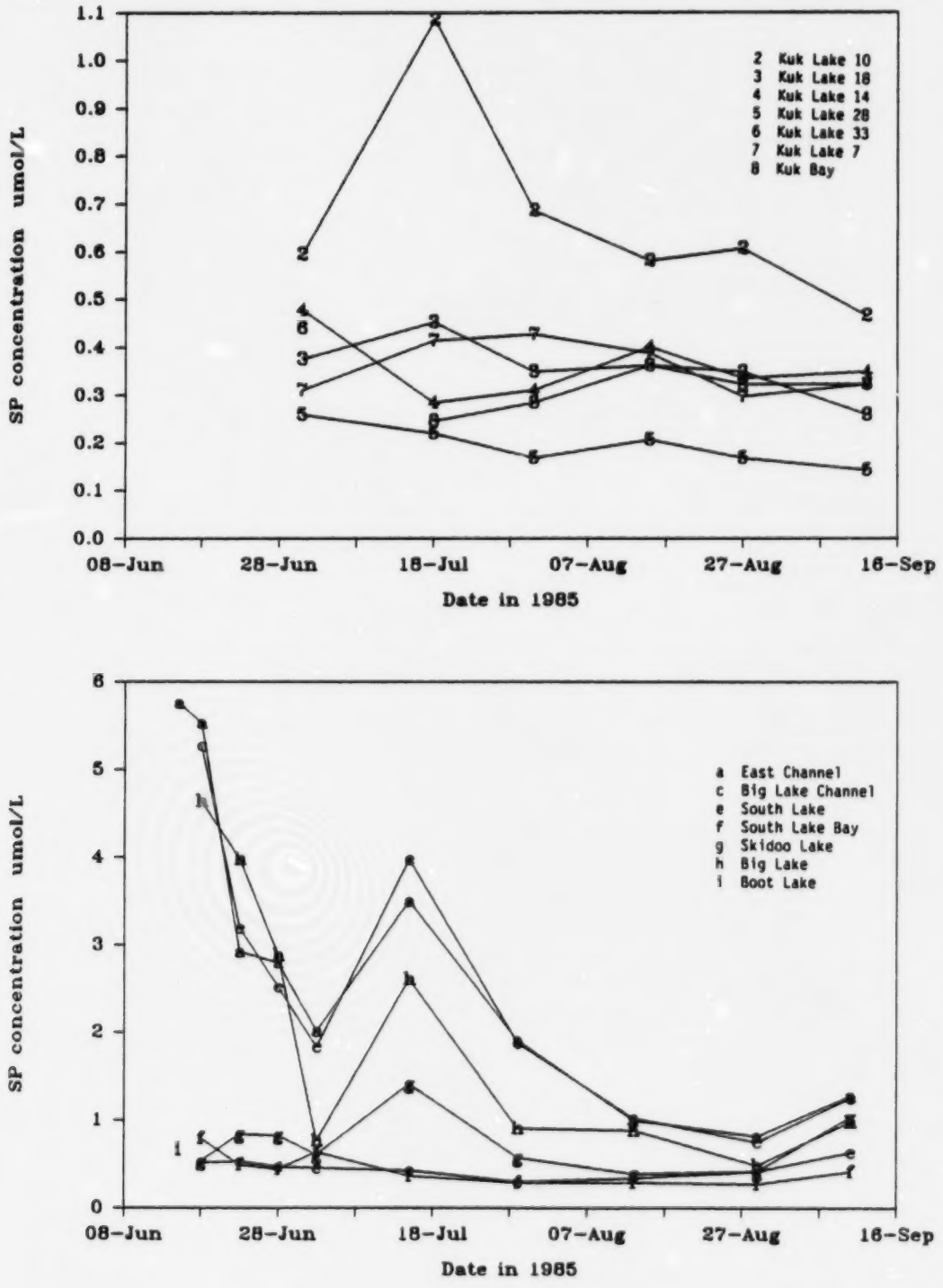



Fig. 8. Suspended phosphorous concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

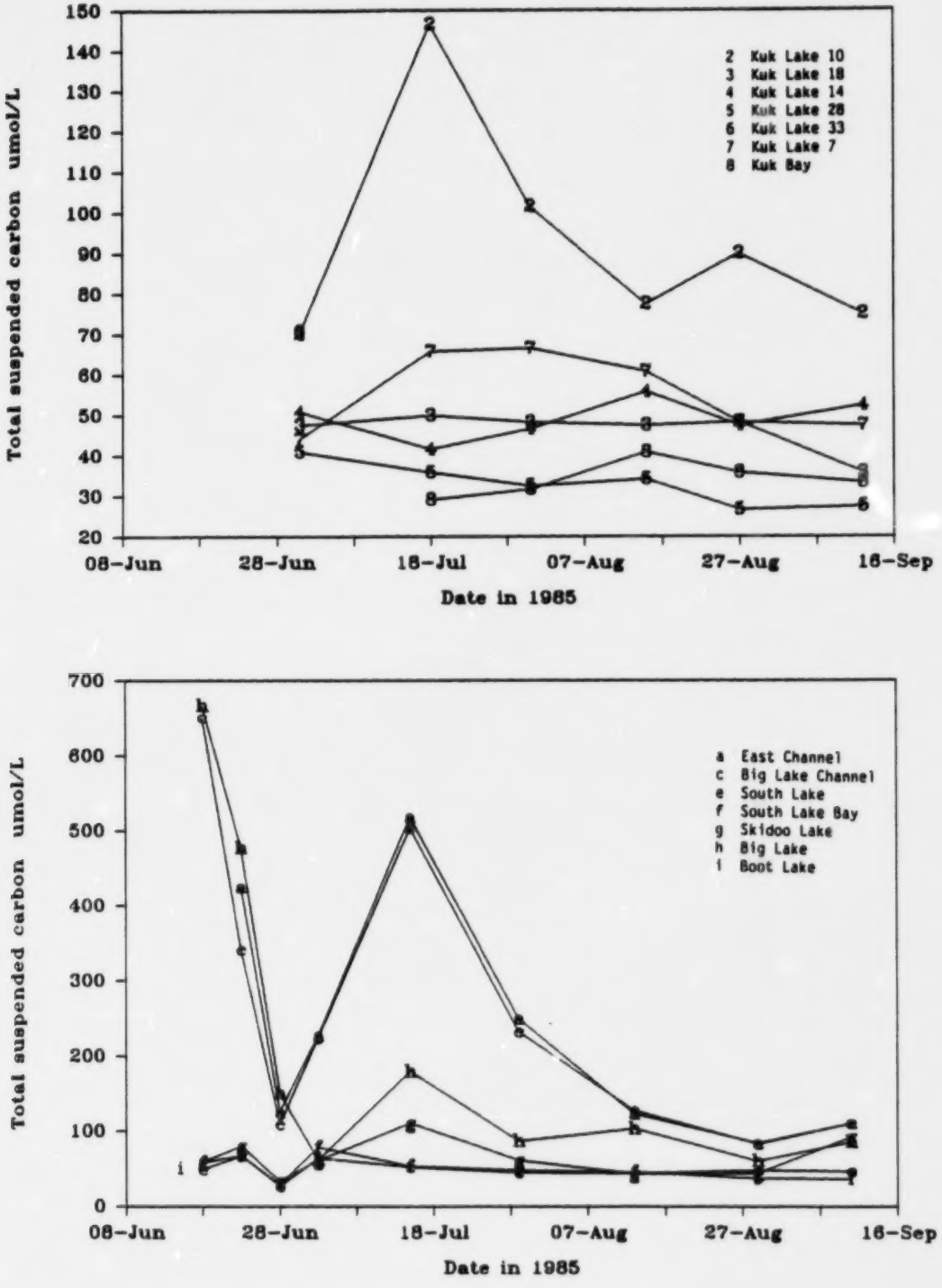



Fig. 9. Total suspended carbon concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

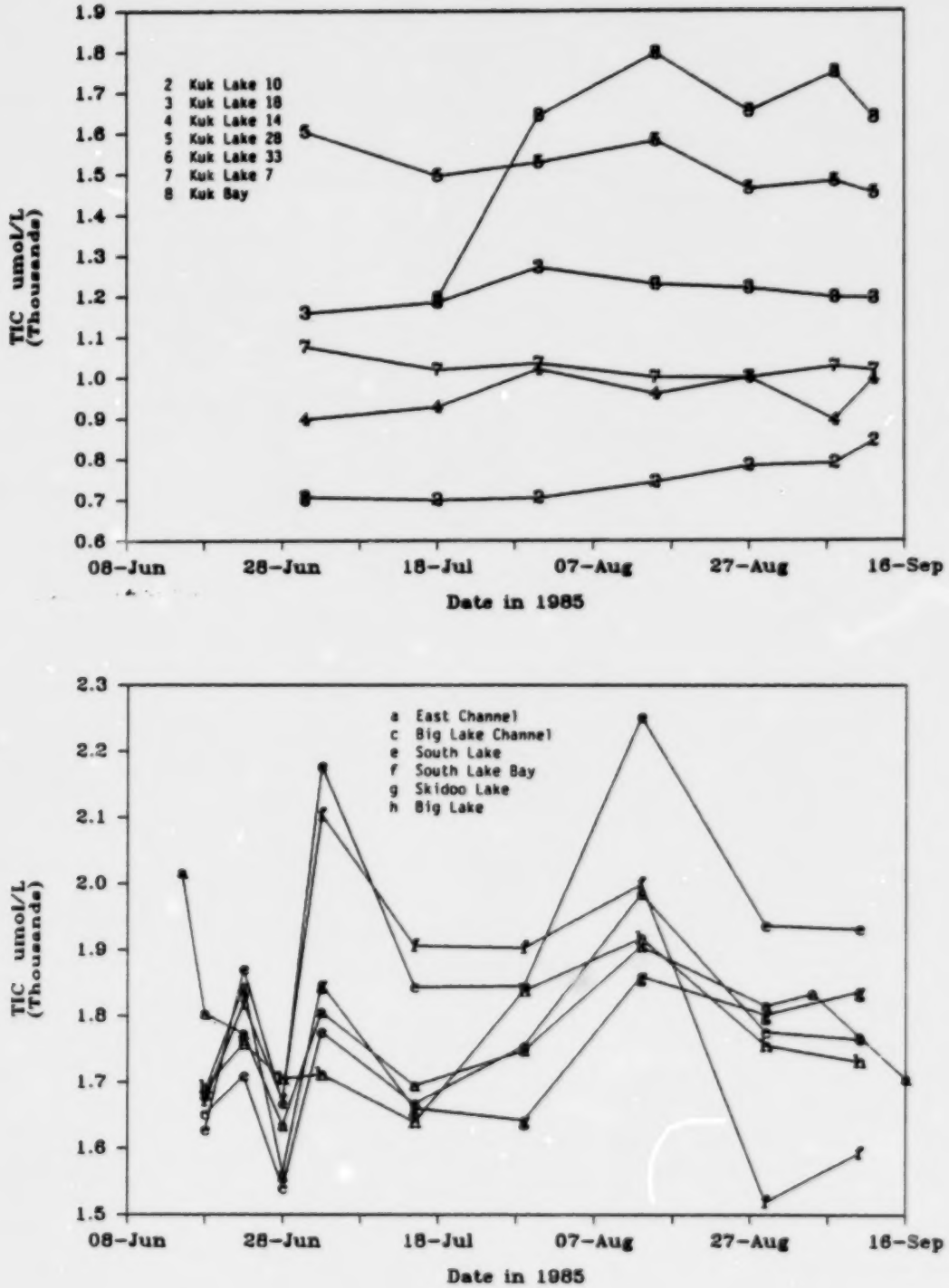



Fig. 10. Total inorganic carbon concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

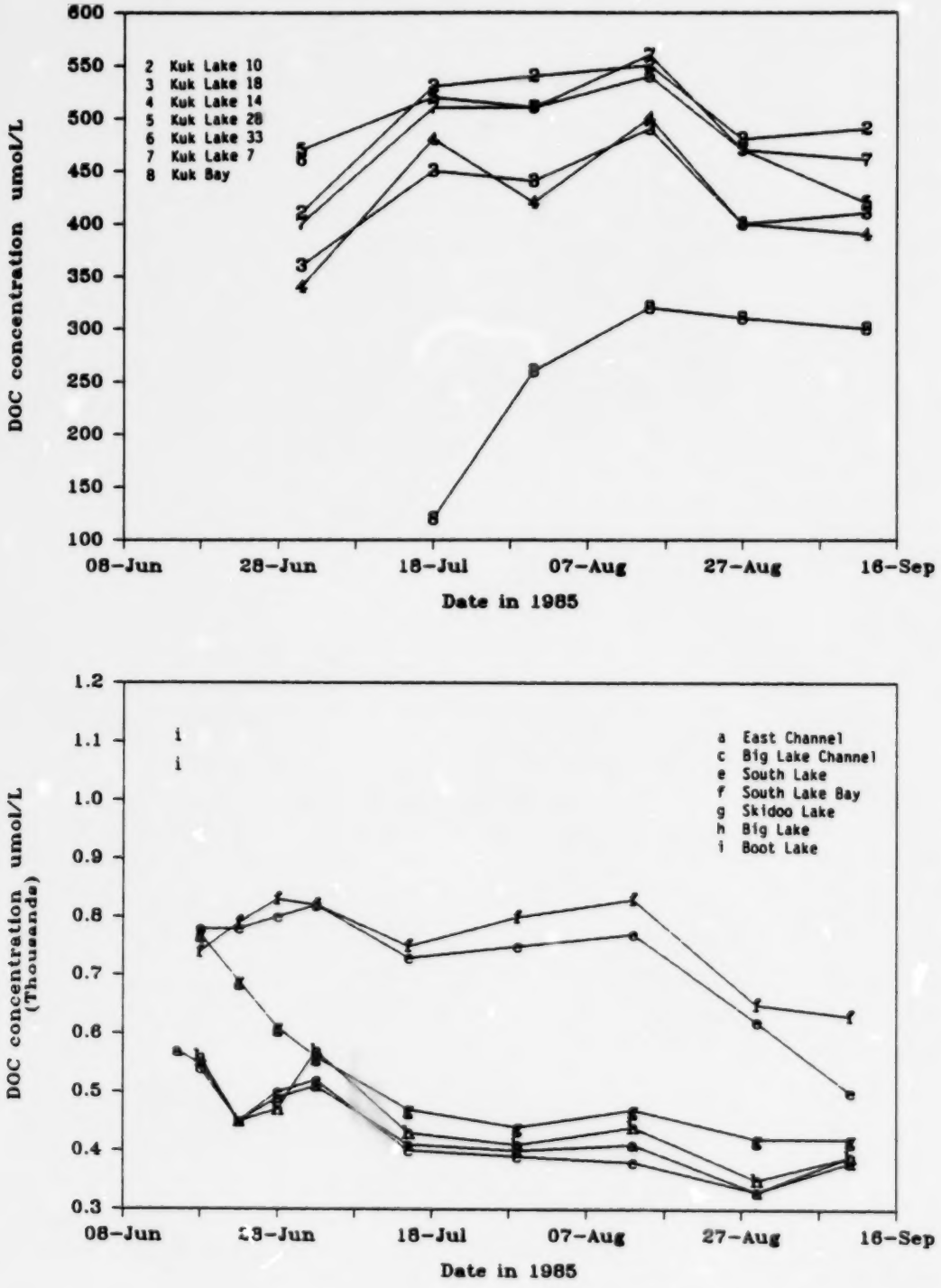



Fig. 11. Dissolved organic carbon concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

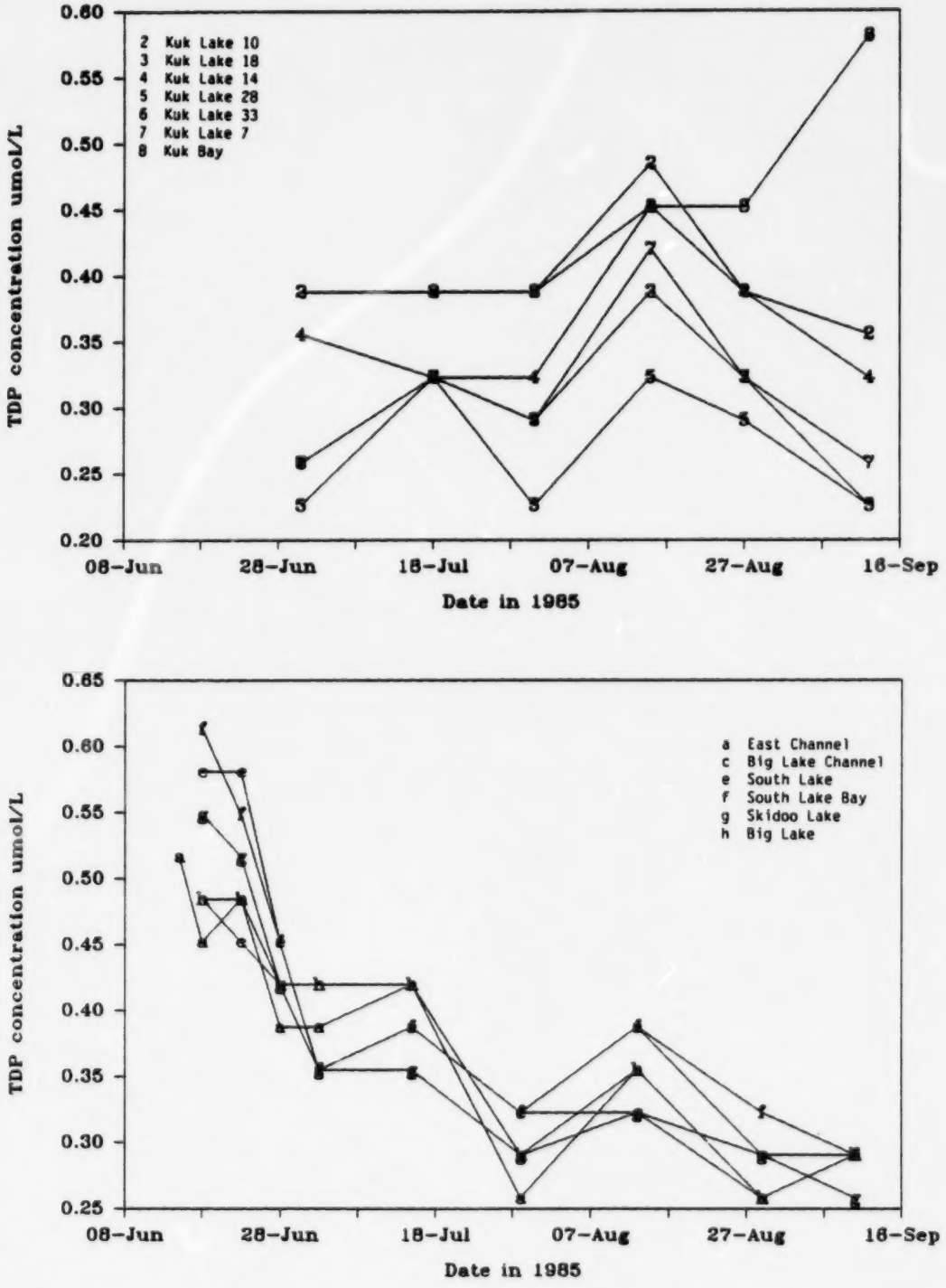



Fig. 12. Total dissolved phosphorous concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

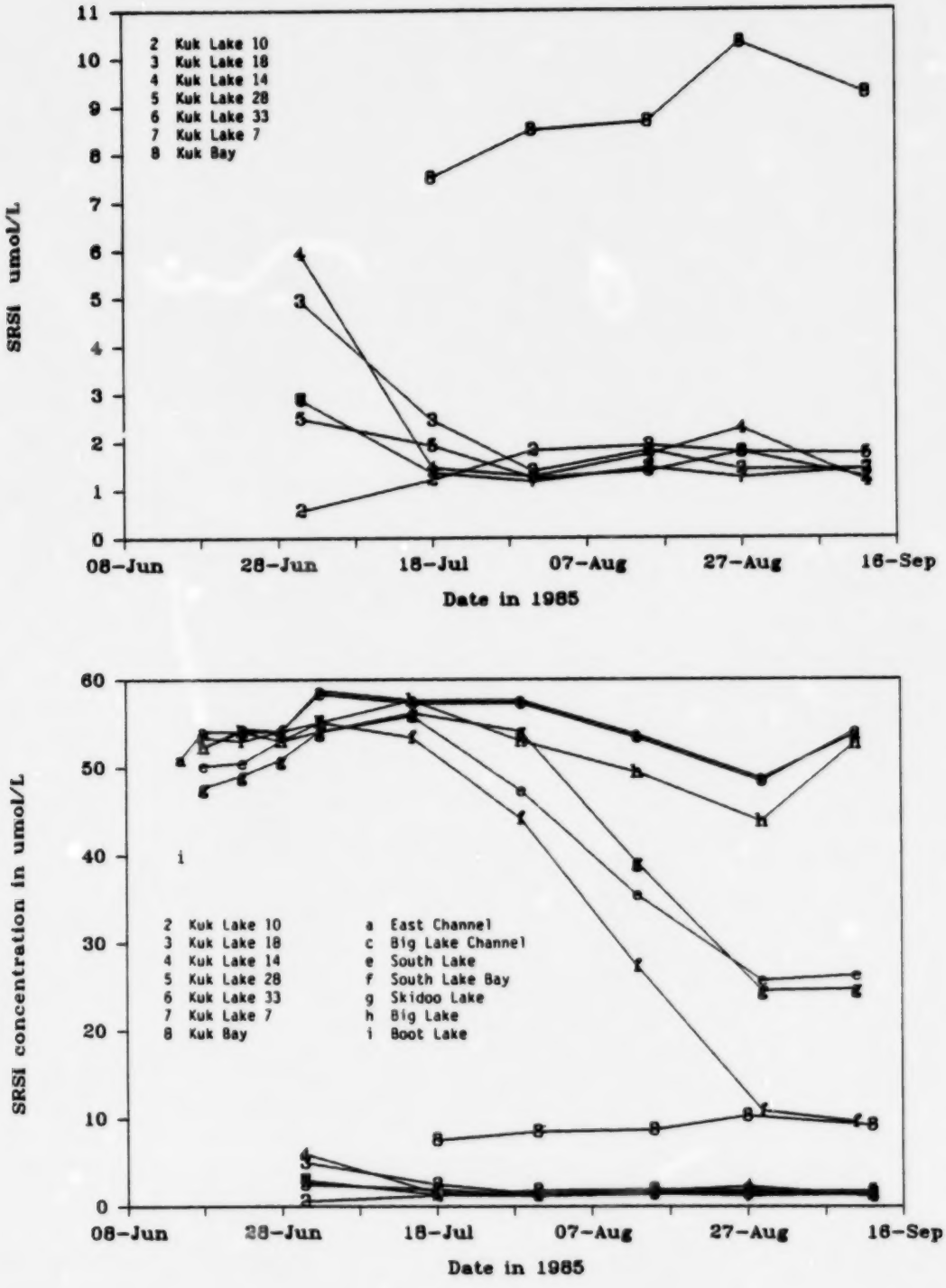



Fig. 13. Soluble reactive silica concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta and Kukjuktuk Bay study areas.

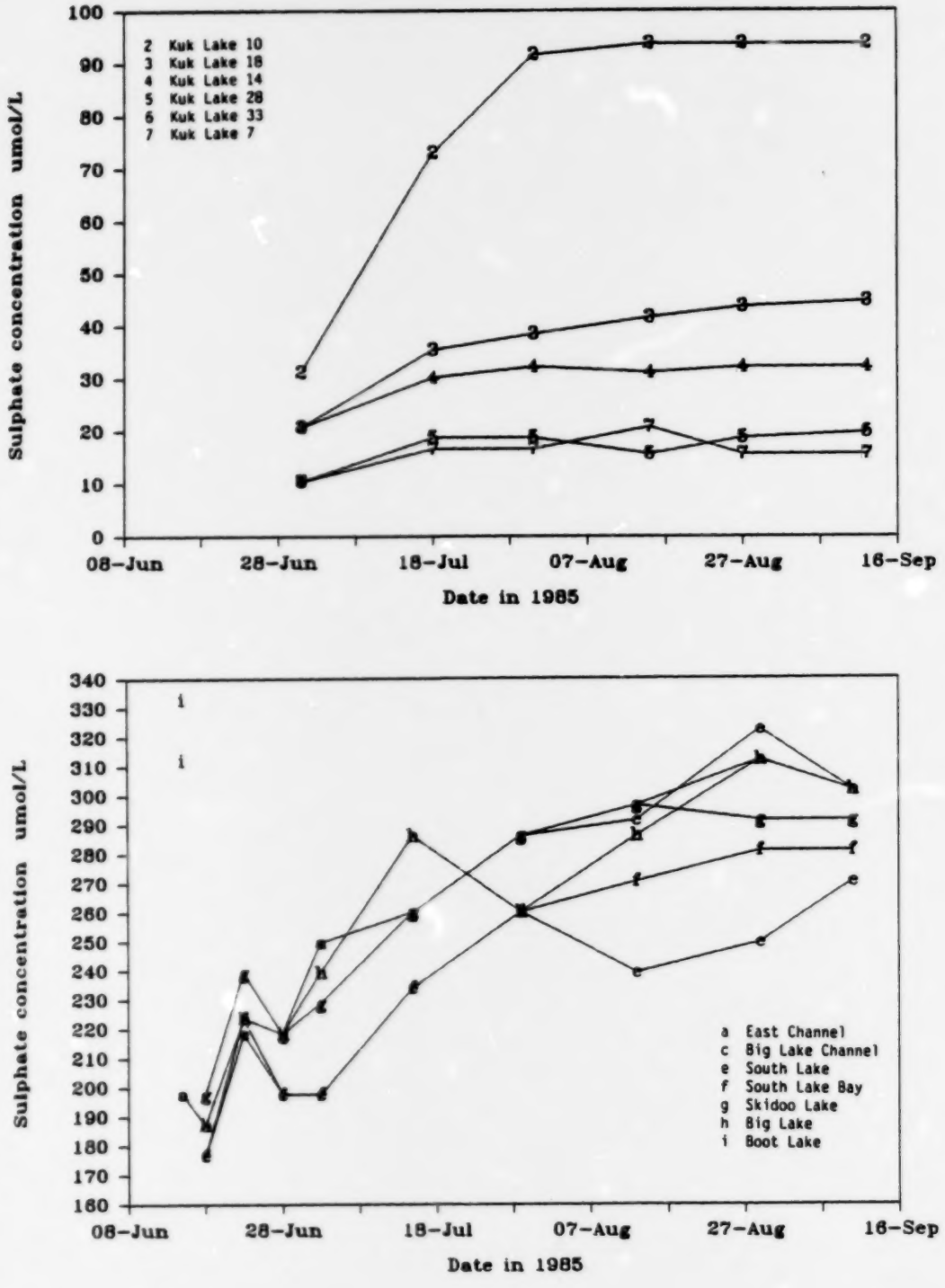



Fig. 14. Sulphate concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

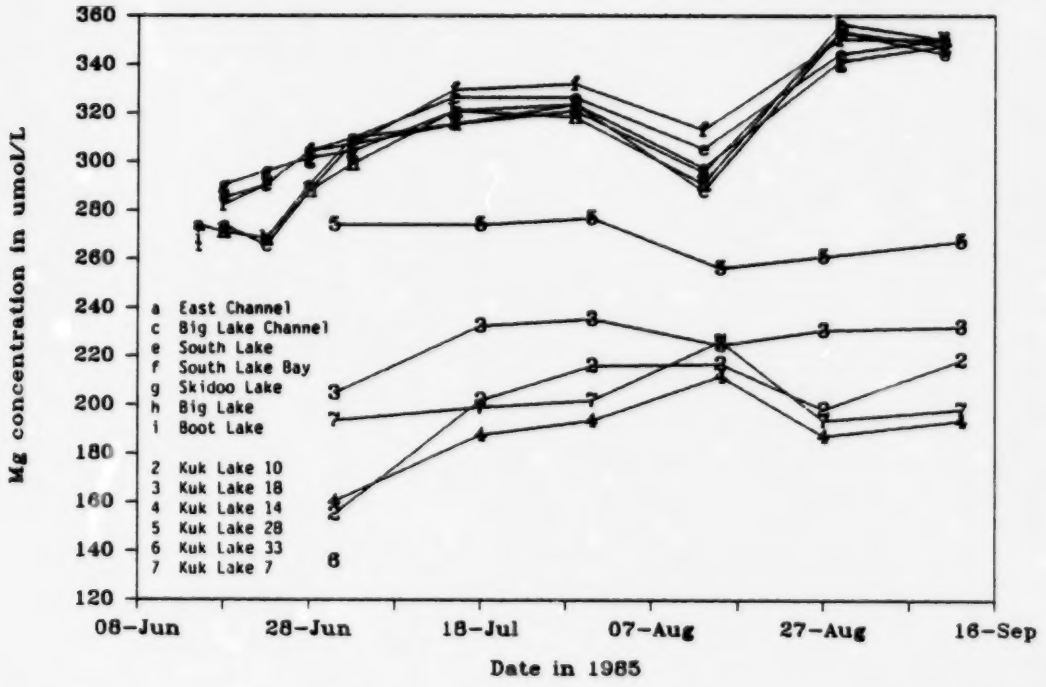



Fig. 15. Magnesium concentration vs time. Stations in the Kukjuktuk Bay and Mackenzie Delta study areas.

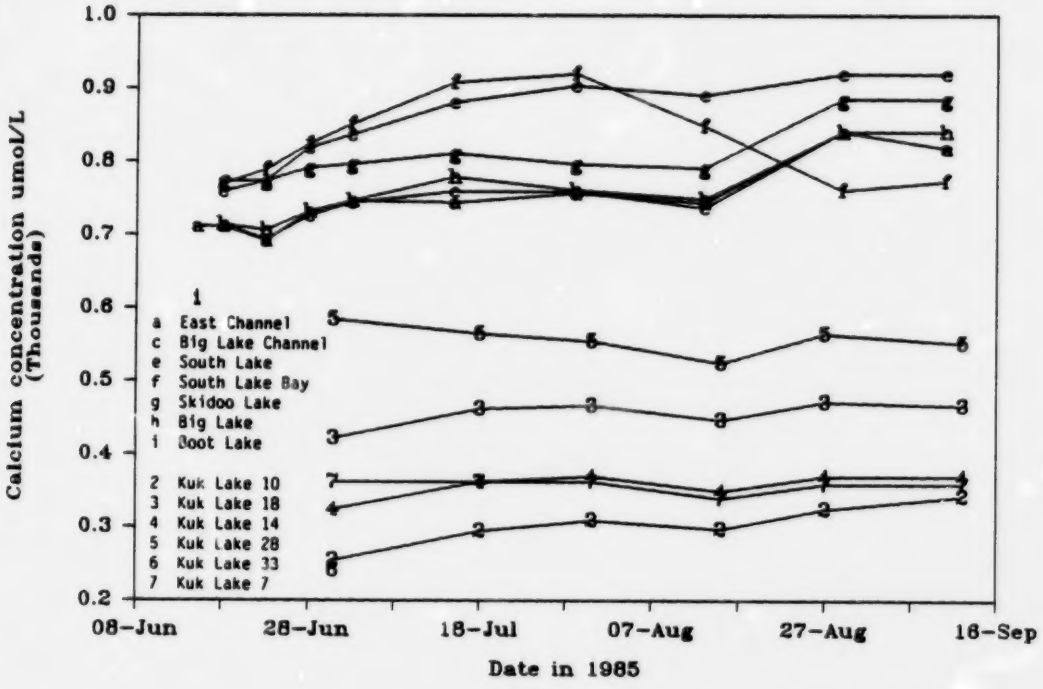



Fig. 16. Calcium concentration vs time. Stations in the Kukjuktuk Bay and Mackenzie Delta study areas.

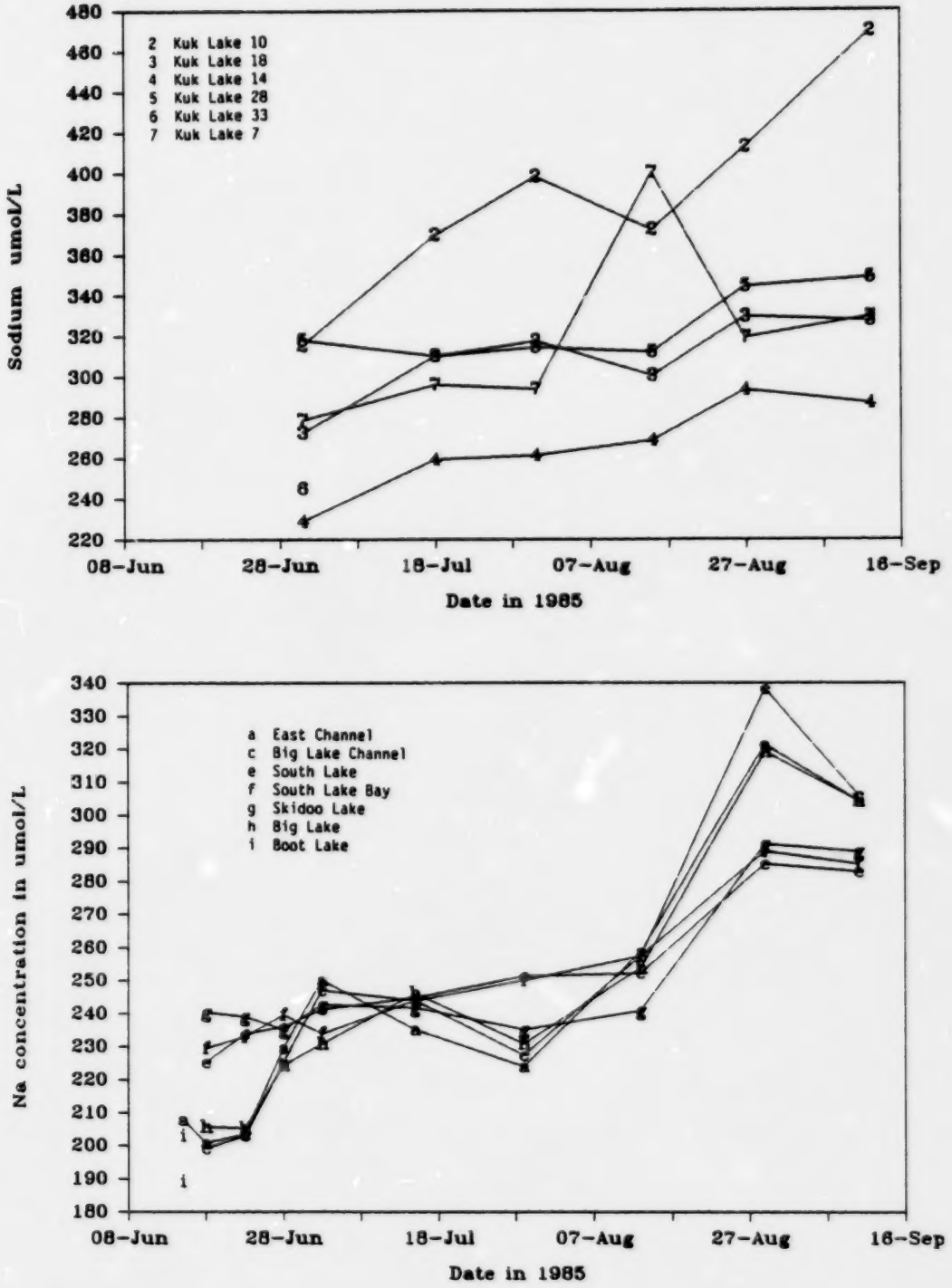



Fig. 17. Sodium concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

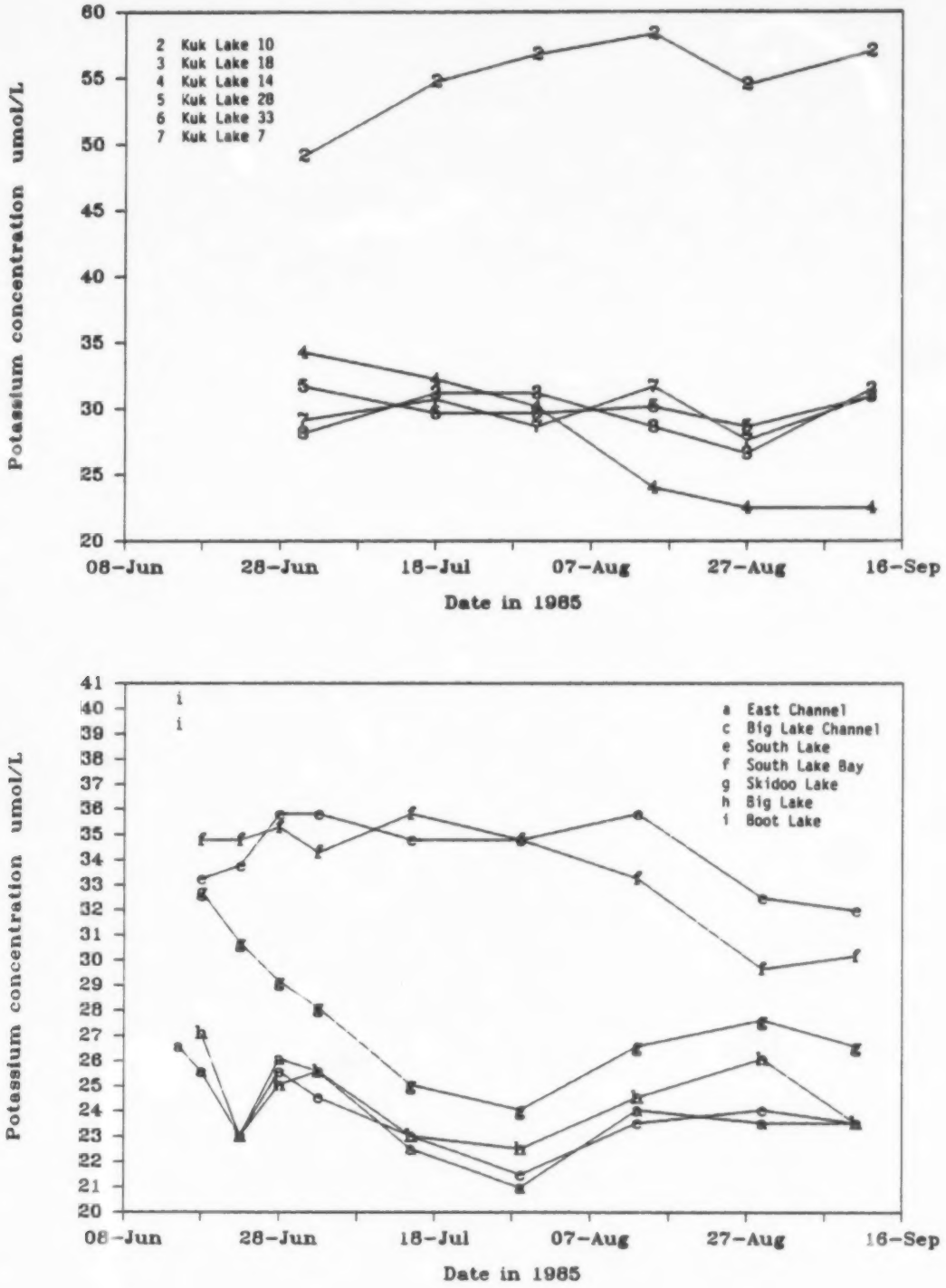



Fig. 18. Potassium concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

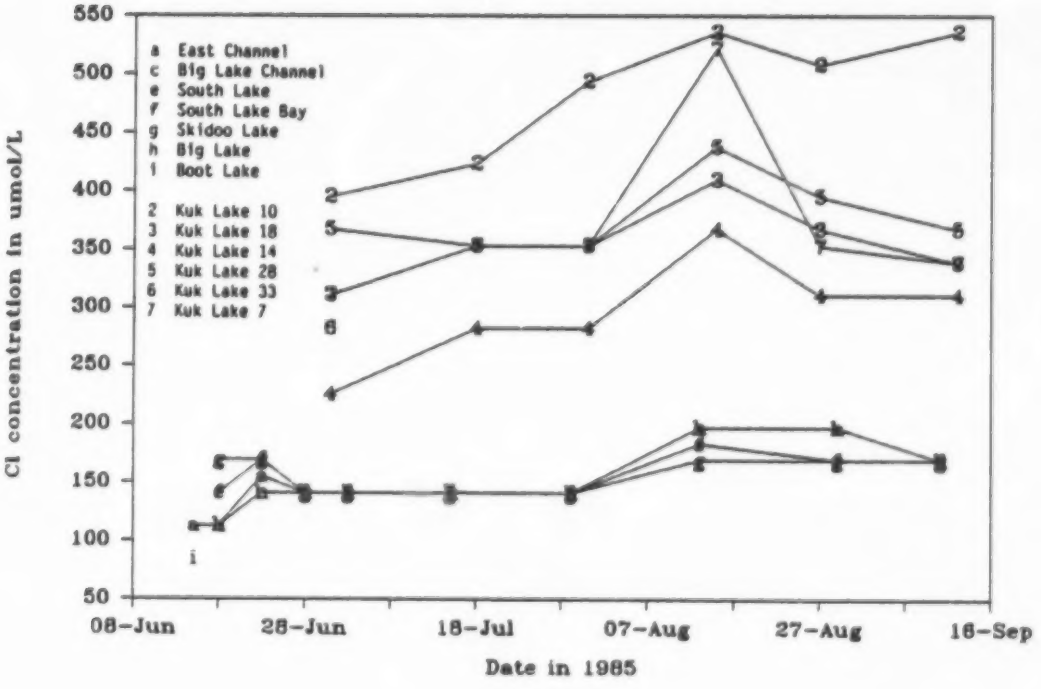



Fig. 19. Chloride concentration vs time. Stations in the Kukjuktuk Bay and Mackenzie Delta study areas.

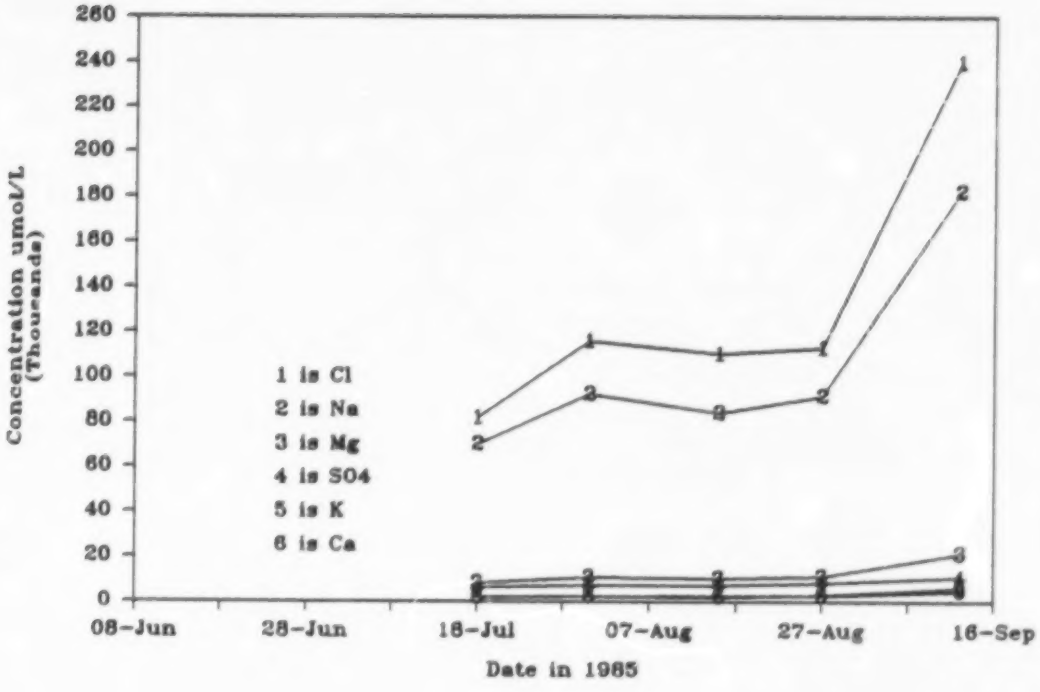



Fig. 20. Kukjuktuk Bay anions and cations vs time.

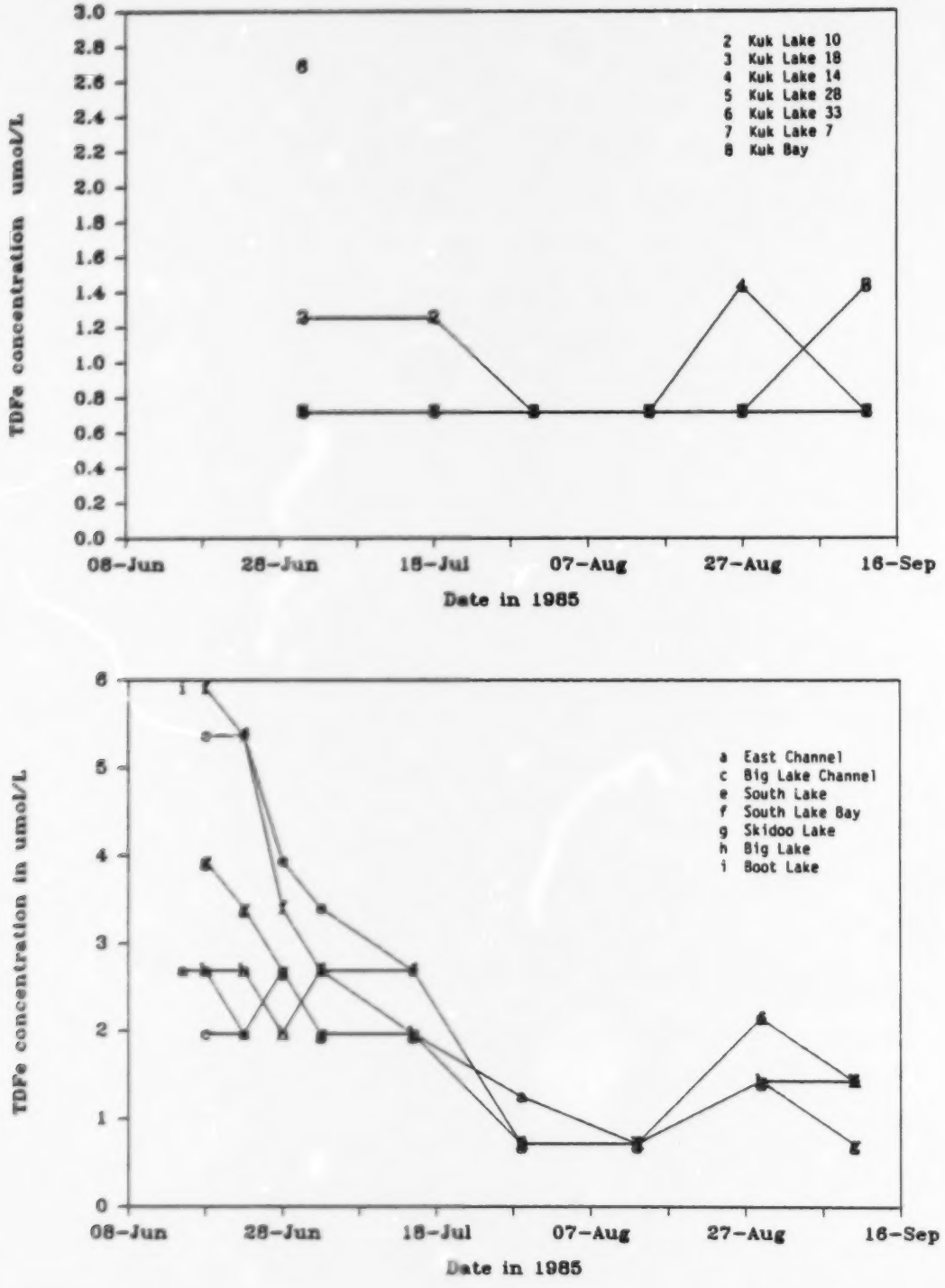



Fig. 21. Total dissolved iron concentration vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

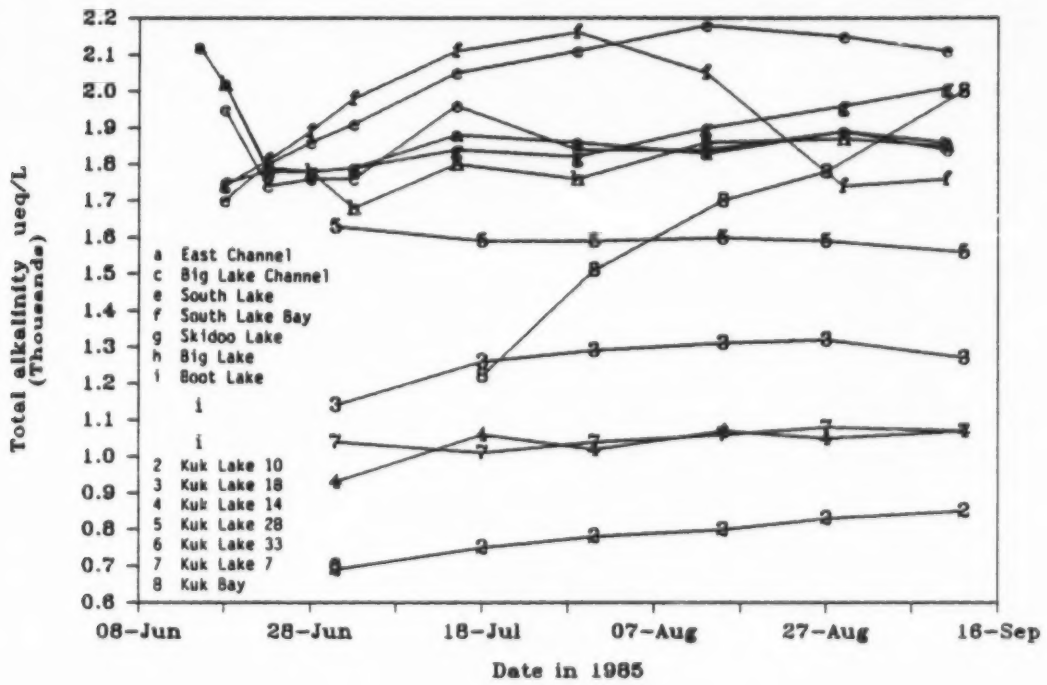



Fig. 22. Total alkalinity vs time. Stations in the Kukjuktuk Bay and Mackenzie Delta study areas.

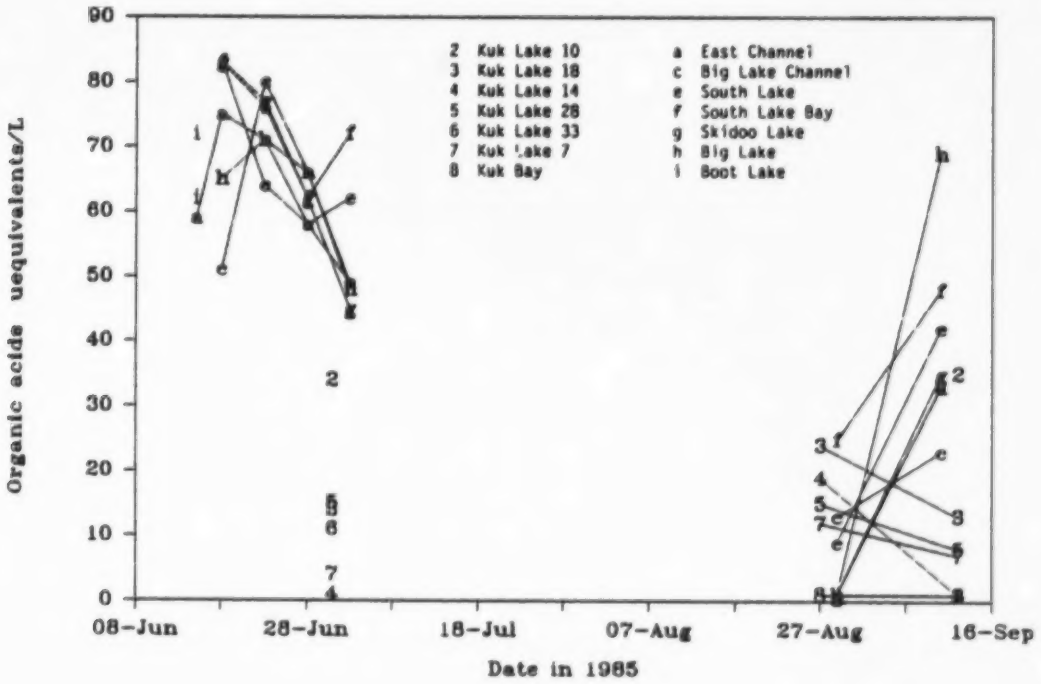



Fig. 23. Organic acids concentration vs time. Stations in the Kukjuktuk Bay and Mackenzie Delta study areas.

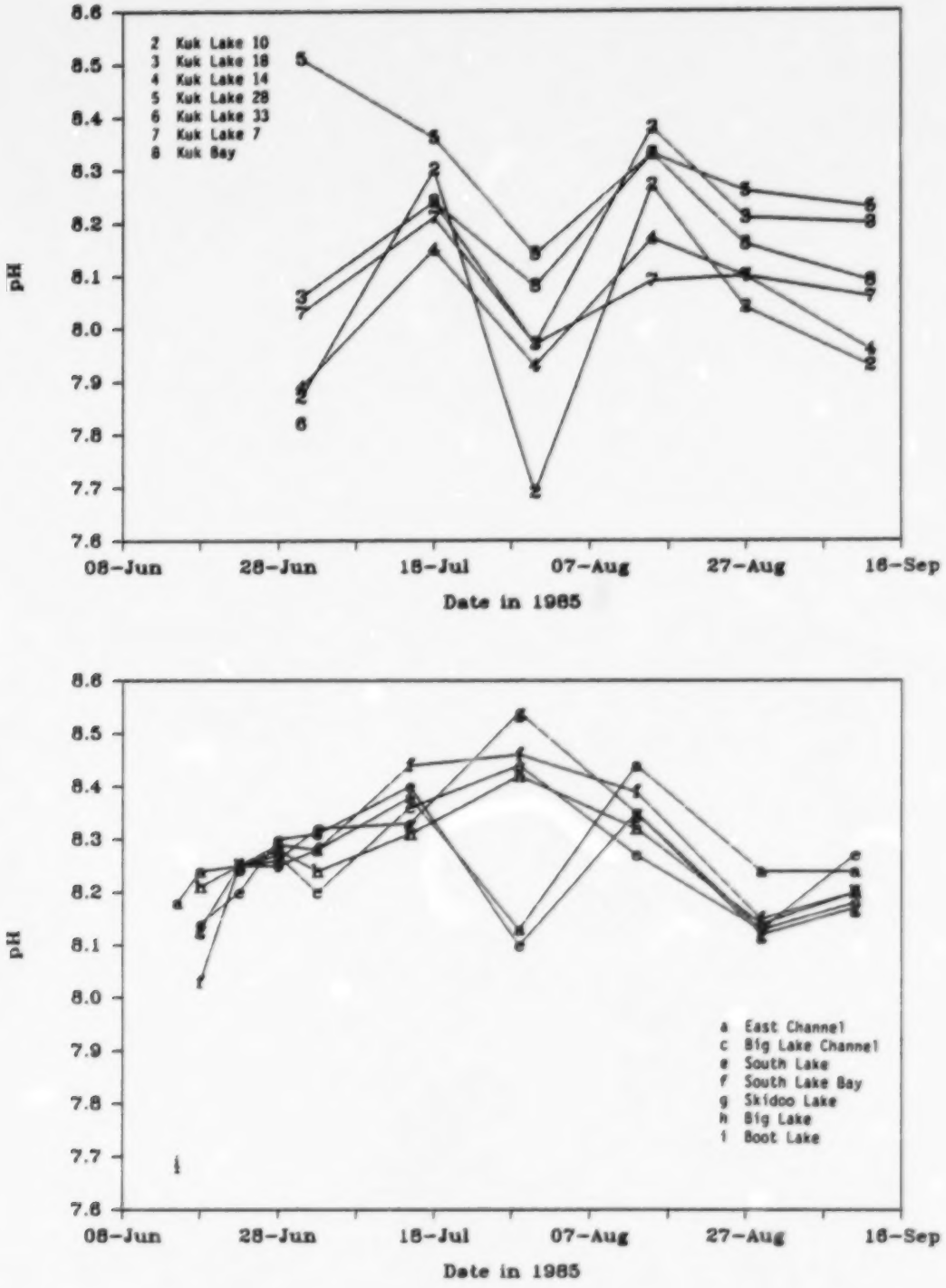



Fig. 24. FWI pH vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

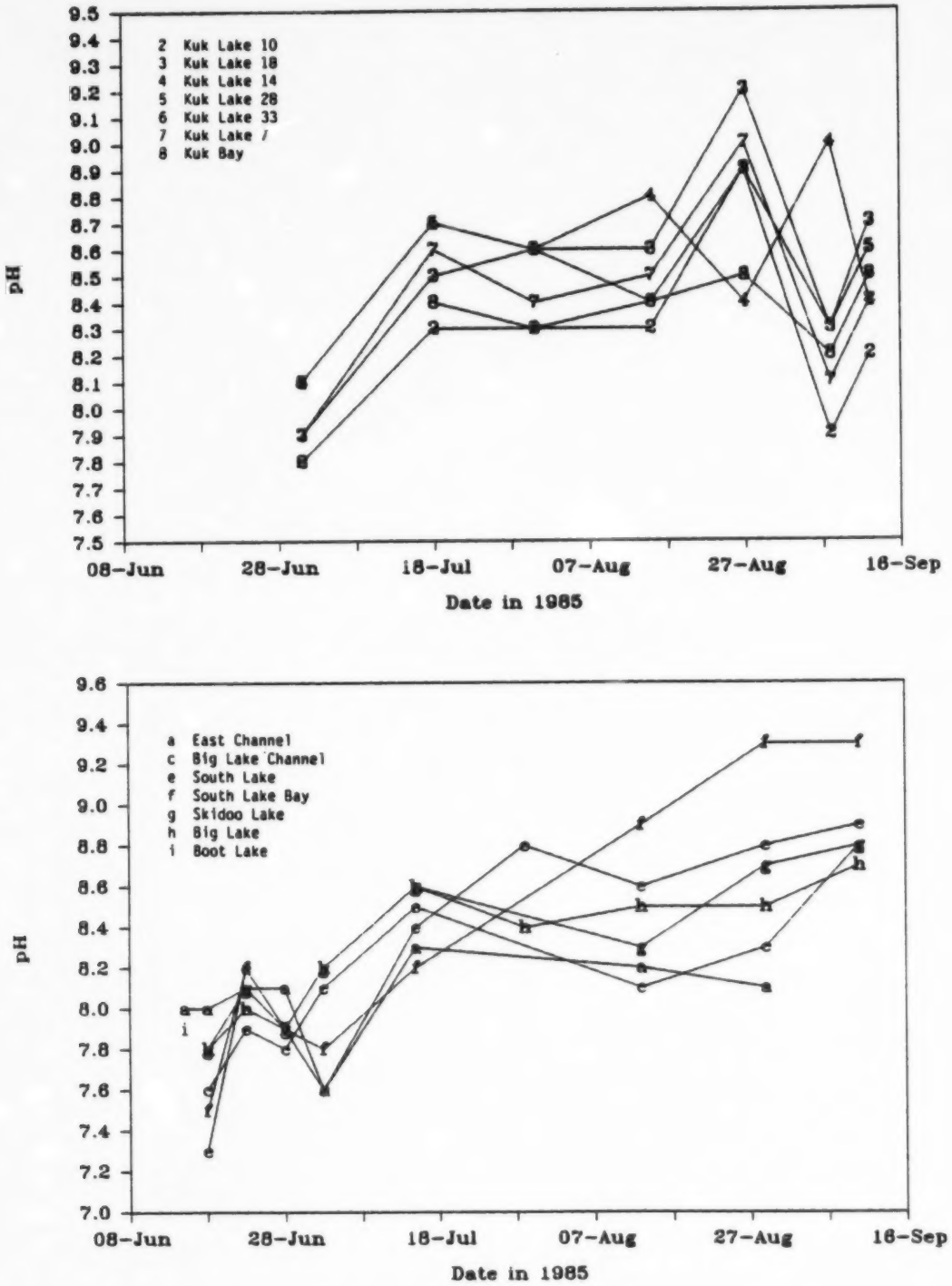



Fig. 25. *In situ* pH vs time. Stations in the Kukjuktuk Bay study area, upper panel, and, lower panel, stations in the Mackenzie Delta study area.

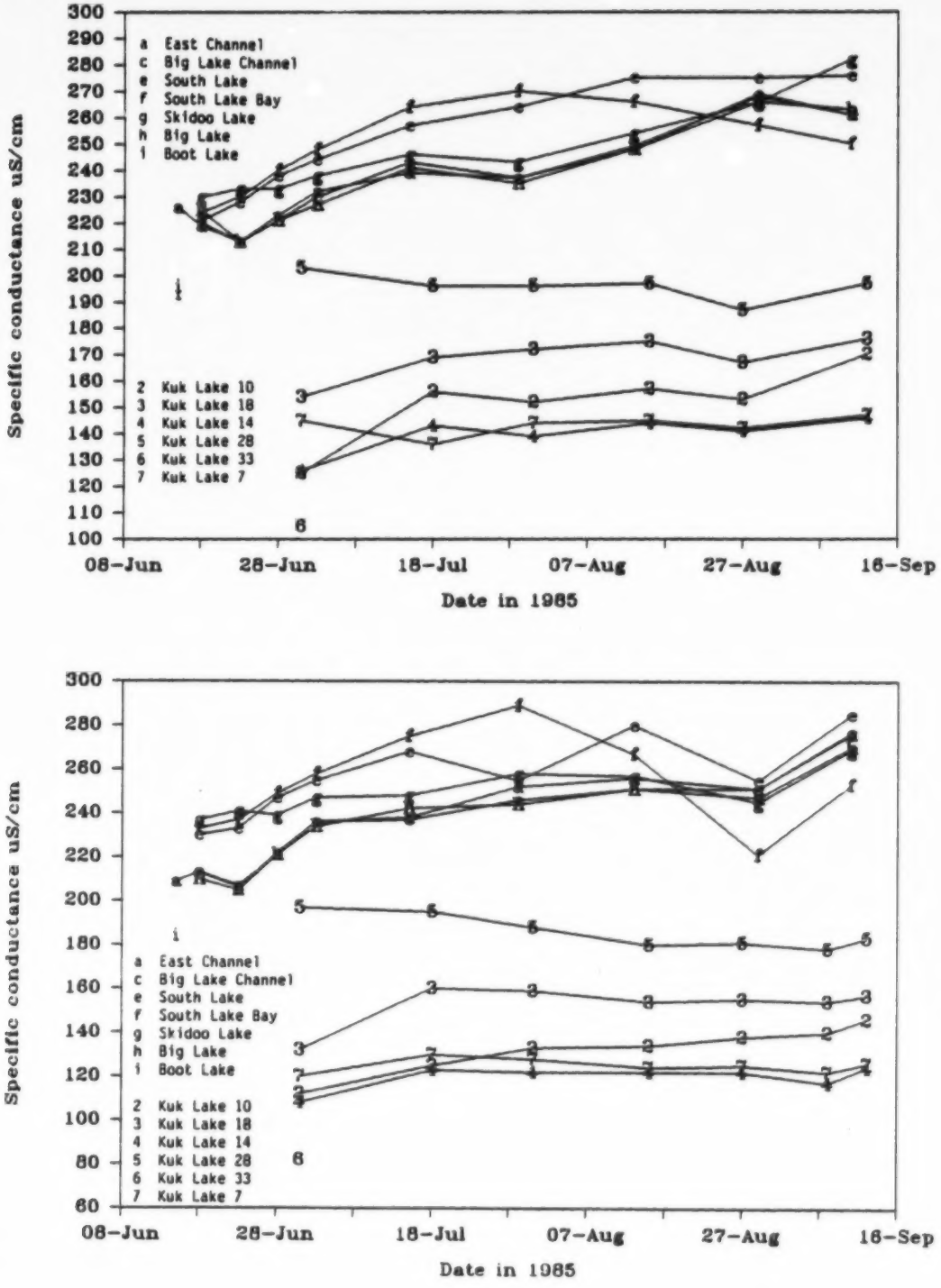
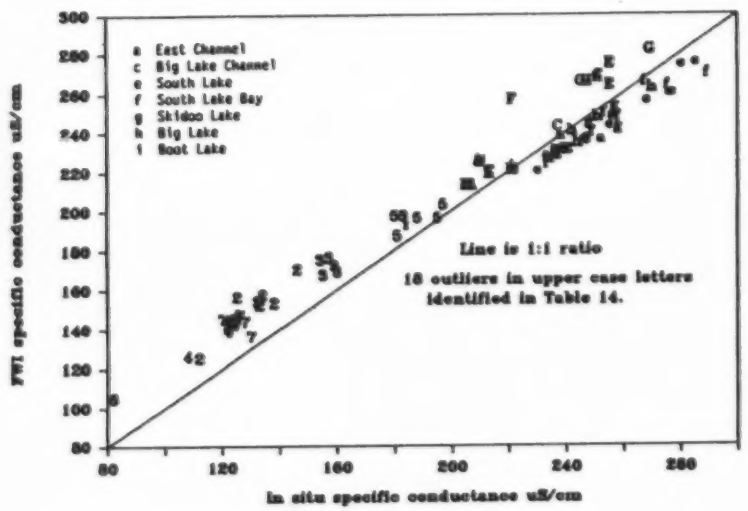
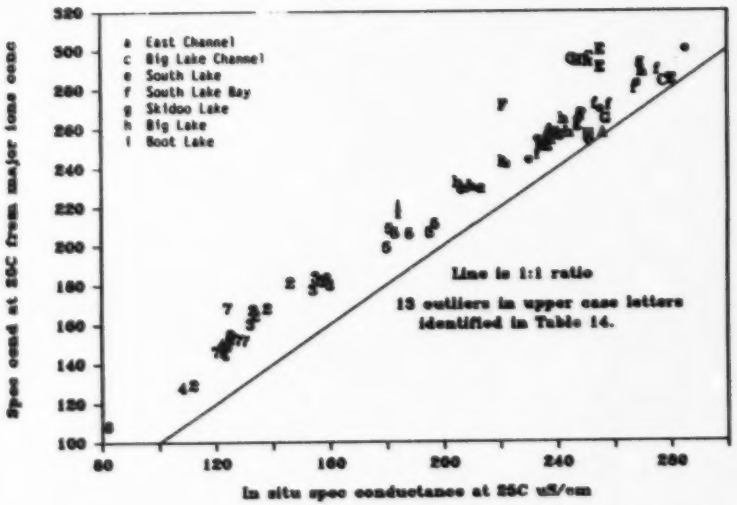



Fig. 26. Specific conductance vs time. Stations in the Kukjuktuk Bay and Mackenzie Delta study areas. FWI data upper panel, and, lower panel, the *in situ* data.


a East Channel
c Big Lake Channel
e South Lake
f South Lake Bay
g Skidoo Lake
h Big Lake
i Boot Lake
Line is 1:1 ratio
18 outliers in upper case letters identified in Table 14.
FWI specific conductance uS/cm
In situ specific conductance uS/cm


a East Channel
c Big Lake Channel
e South Lake
f South Lake Bay
g Skidoo Lake
h Big Lake
i Boot Lake
Line is 1:1 ratio
13 outliers in upper case letters identified in Table 14.
Spec cond at 25C from major ions conc
In situ spec conductance at 25C uS/cm

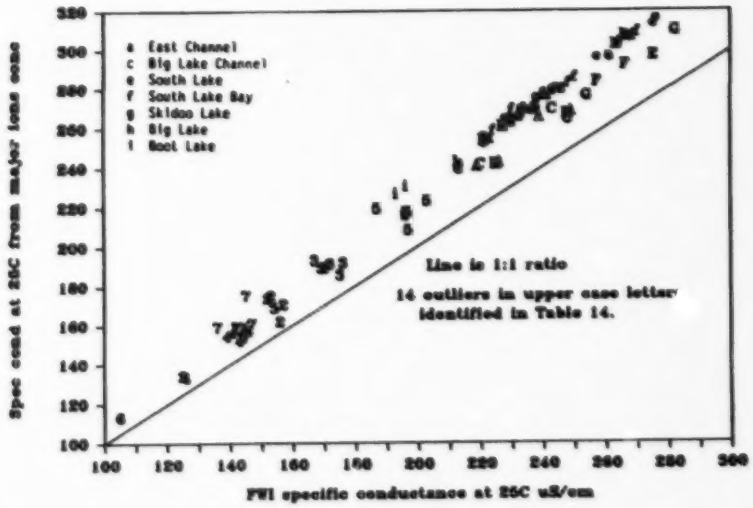

a East Channel
c Big Lake Channel
e South Lake
f South Lake Bay
g Skidoo Lake
h Big Lake
i Boot Lake
Line is 1:1 ratio
14 outliers in upper case letter identified in Table 14.
Spec cond at 25C from major ions conc
FWI specific conductance at 25C uS/cm

Fig. 27. Specific conductance comparisons. Above, FWI specific conductance vs *in situ* specific conductance. Calculated *in situ* specific conductance vs observed *in situ* specific conductance, upper right, and calculated FWI specific conductance vs observed FWI specific conductance, lower right. Data points in upper case letters have been judged to be outliers.

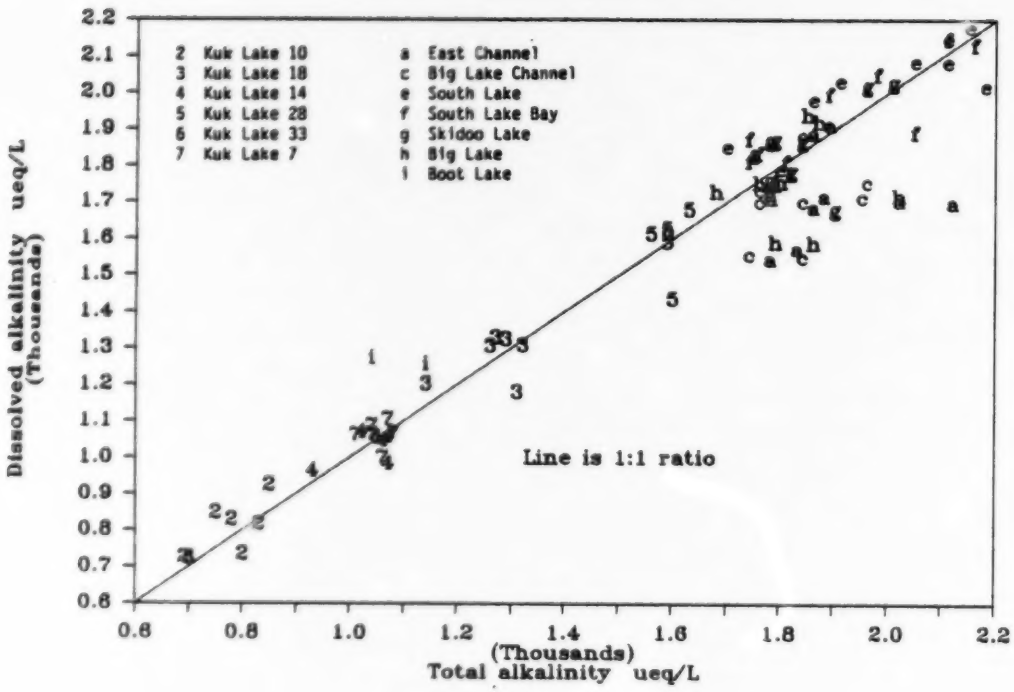



Fig. 28. Dissolved alkalinity vs the observed total (FWI) alkalinity. The dissolved alkalinity is calculated from analytical anionic and cationic data.

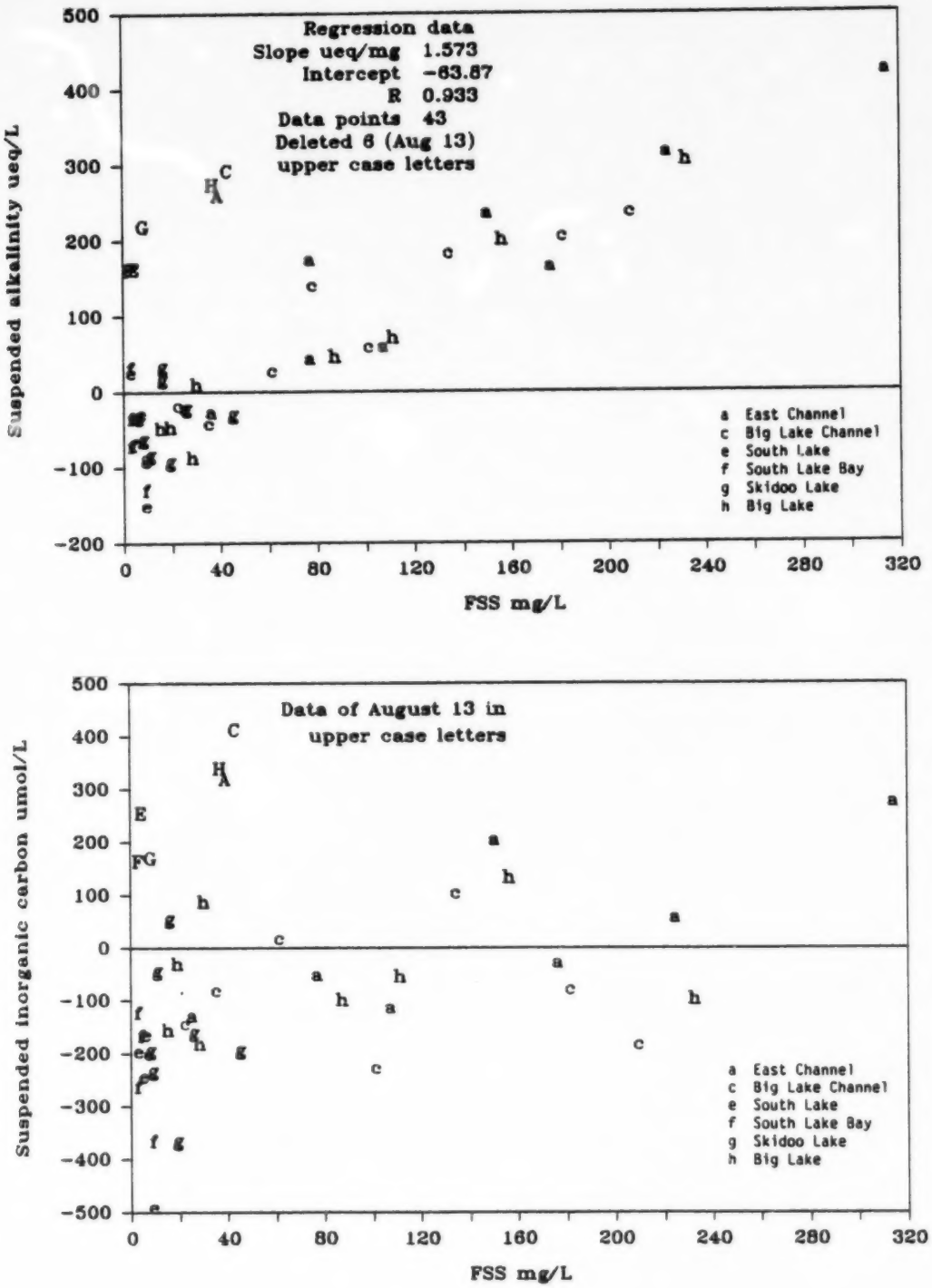



Fig. 29. Relationships between FSS in the Mackenzie Delta and suspended alkalinity, upper panel, and, lower panel, suspended inorganic carbon.

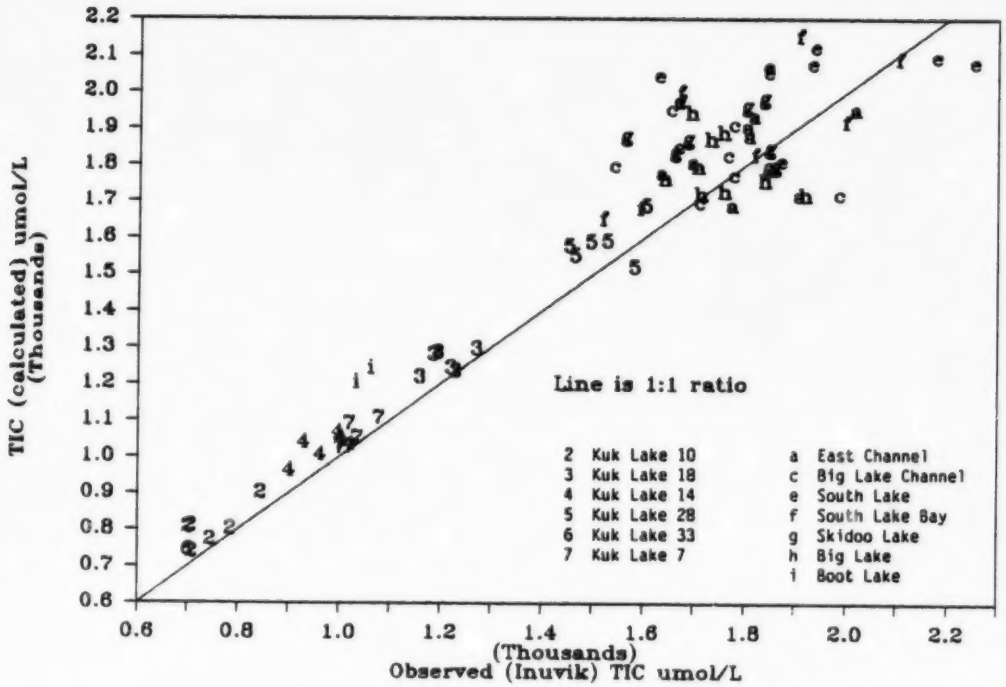
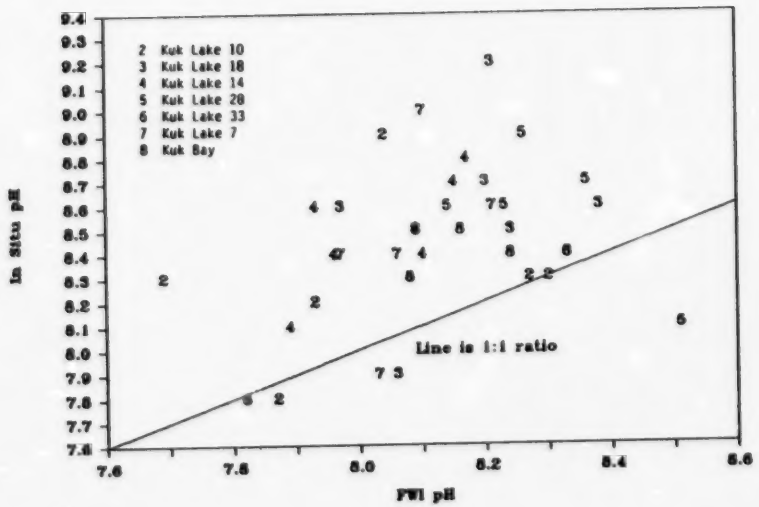
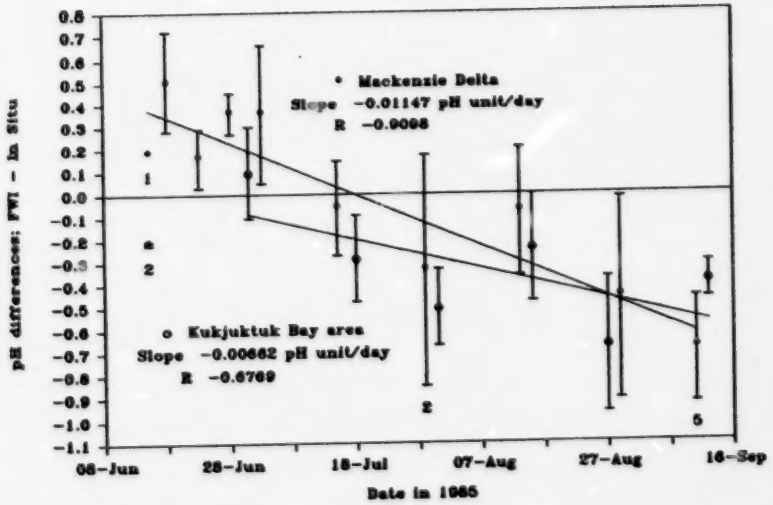



Fig. 30. Comparison of total inorganic carbon. The abscissa are the values observed at the Inuvik laboratory while the ordinates are calculated from the FWI total alkalinity.



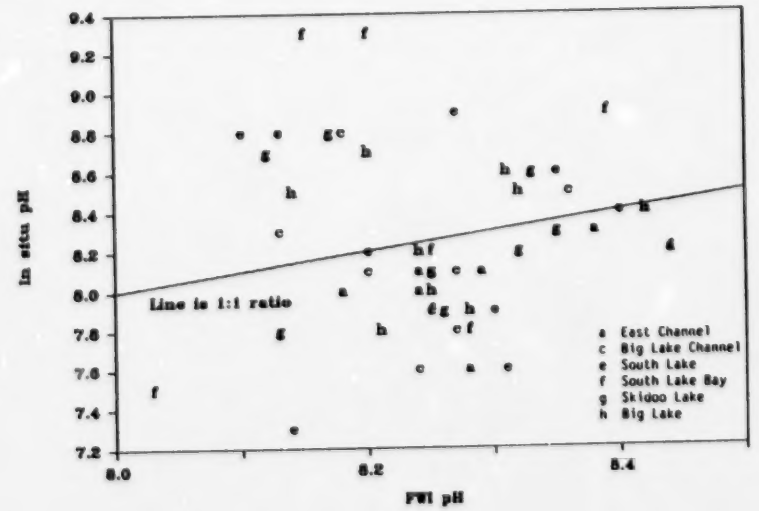




Fig. 31. Comparison of *in situ* pH and FWI pH. To the left are graphs of the FWI pH vs the *in situ* pH; stations in the Kukjuktuk Bay study area, upper left, and stations in the Mackenzie Delta study area, lower left. Above, the mean difference (FWI - *in situ*) in pH of stations in the Mackenzie Delta study area vs time. Error bars are one standard deviation on each side of the mean. The mean on each date is the average of six values. Exceptions are indicated by showing, below the error bars, the number of data points included in the mean. On June 15 the single point is the East Channel while the two value mean is Boot Lake.

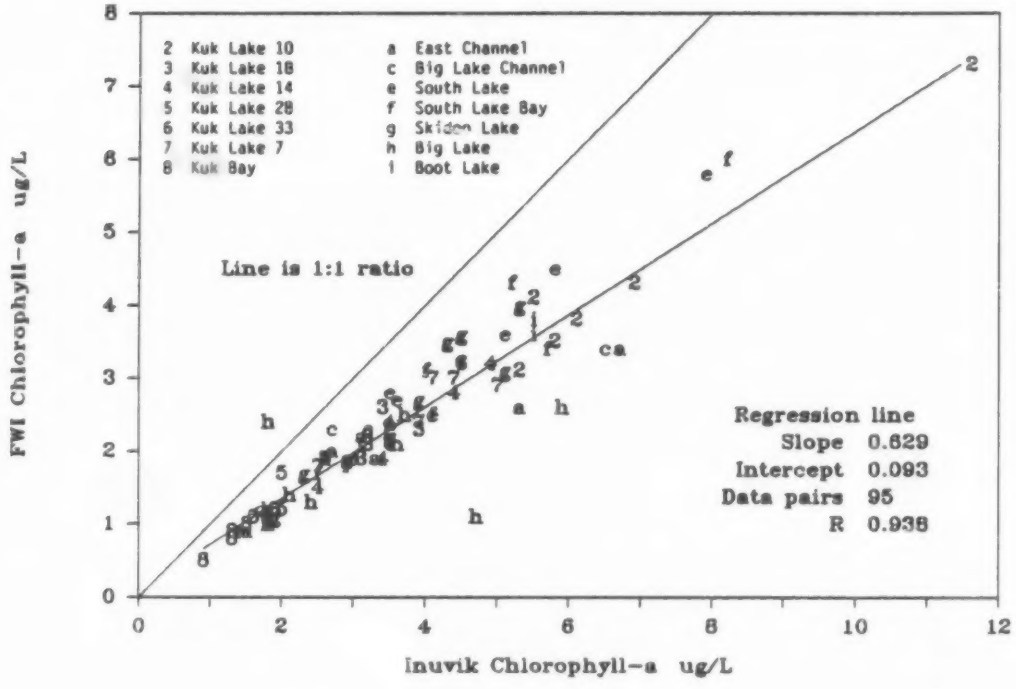



Fig. 32. Comparison of FWI chlorophyll-a with Inuvik chlorophyll-a.

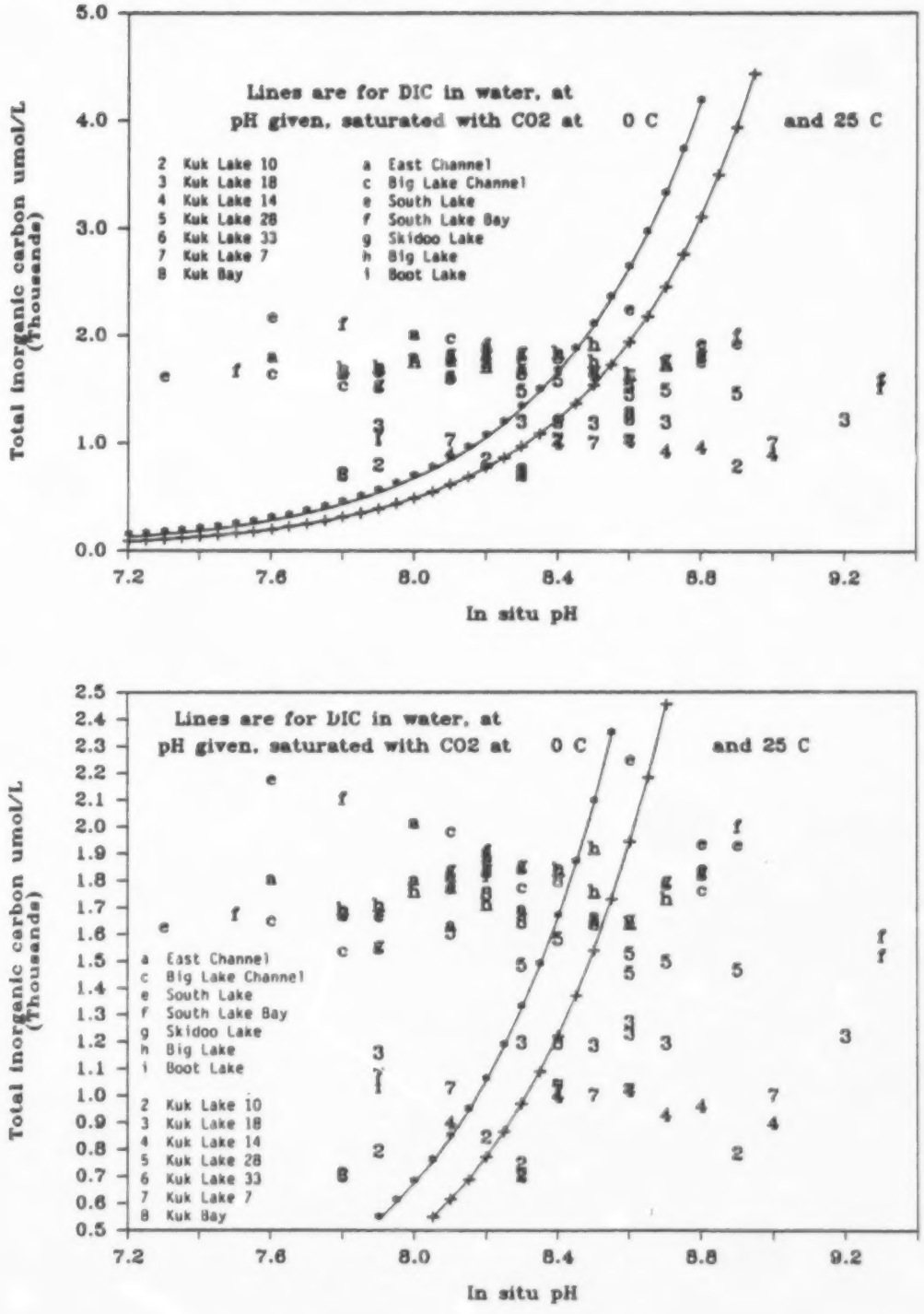



Fig. 33. TIC concentration vs pH for the lakes and channels of the Kukjukktuk Bay and Mackenzie Delta study areas and DIC in water as a function of pH at 0°C and 25°C. The partial pressure of atmospheric $CO_2$ is taken as $10^{-3.5}$ atmosphere. The lower panel is an enlargement of the upper panel.